

# Chemical Week



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New poison ivy remedies vie  
for a piece of \$10-million  
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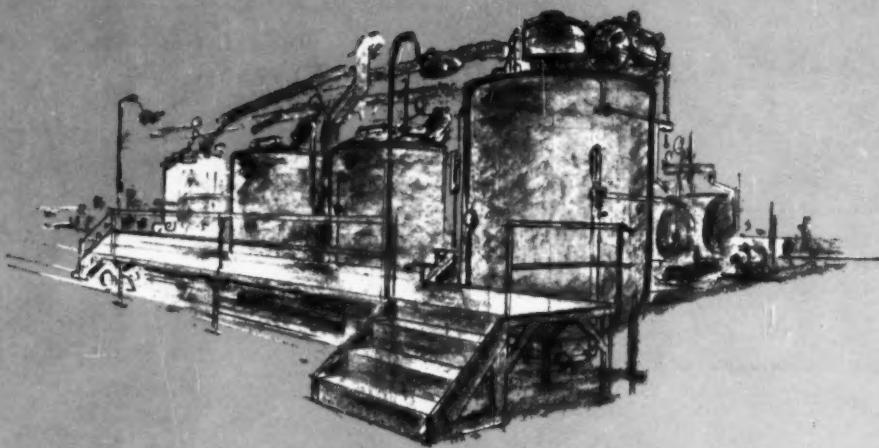
◀ Plant models—how engineer-  
ing stand-by is becoming a  
management tool . . . p. 89

June 27, 1959

ANN ARBOR MICH  
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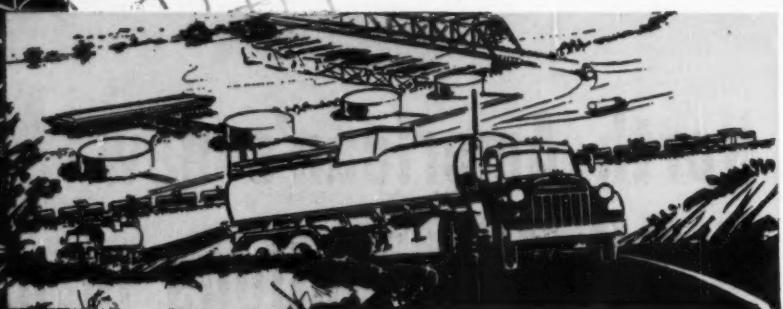
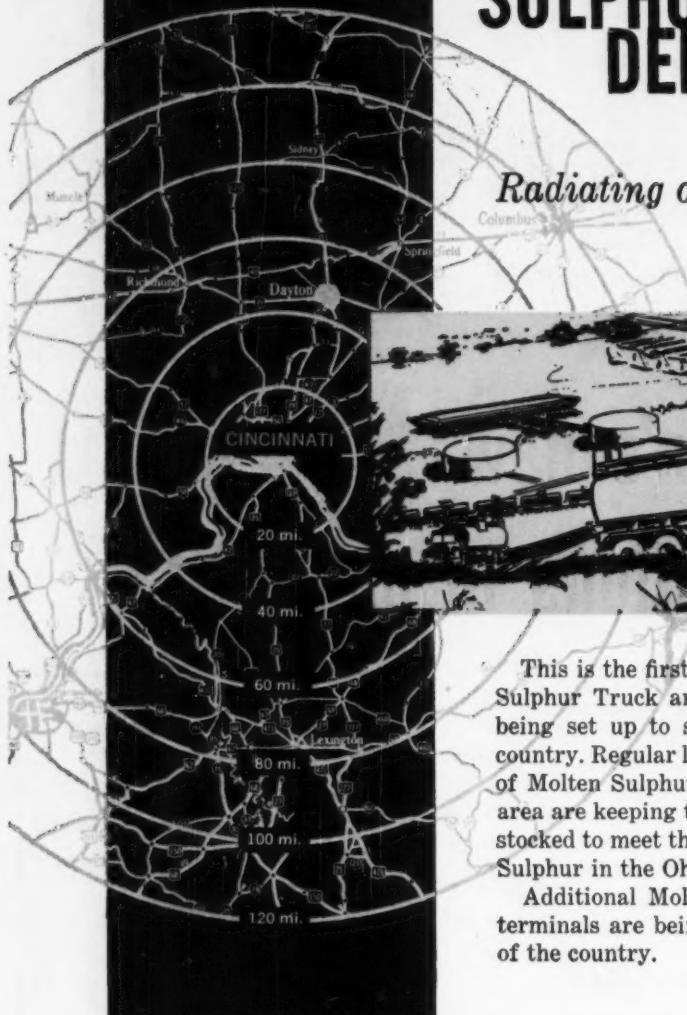
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# Chemical Week

## TOP OF THE WEEK

JUNE 27, 1959

- Editorial: Let's talk sense about plastic-bag mishaps ..... p. 14
- Drug industry sets sights on 1963 as year for cancer cure, advanced mental drugs ..... p. 72
- International Minerals' new agricultural division — the story behind its conception and goals ..... p. 95

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Another boost for acrylonitrile: Du Pont — biggest consumer — plans to build unit at Memphis. Company may be planning second plant for Gulf Coast site.

27 With new phthalic anhydride plant about to come onstream, Witco favors more vertical integration to keep sales and earnings on up-trend.

27 General Dynamics—determined to be a big name in the CPI—is working on acquisition of hefty petrochemical venture to cap last week's purchase of industrial gas producer.

28 Tighter squeeze on CPI profits shows up strong in government's new report on industry-by-industry performance in first-quarter '59.

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### 48 ADMINISTRATION

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Southern Research Institute meeting on "The Undiscovered Earth" yields advanced ideas on unlocking earth's materials and energy.

72 Drug industry will spend \$200 million on research this year, sets sights on cancer cure, better psychic energizers by 1963.

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### 95 SALES

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99 St. Regis readies new entry in stretchable paper field.

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43,390 copies of this issue printed

Vol. 84

No. 26

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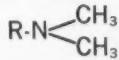
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Armour reduces tertiary amine prices 22%

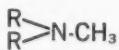
New production facilities are now turning out commercial quantities of both high purity alkyldimethyl and dialkylmethyl tertiaries at a saving of 13¢ to 25¢ per pound!

Here are economical cationic starting materials for a wide range of new products and processes. The entire series sets new industry standards for these commercial chemicals in tertiary amine content and color, making them extremely useful in many surfactant applications.

Armeens® DM18D, DM16D, DMSD, DMCD and DMHTD are Armour's series of alkyldimethylamines with the following configuration:



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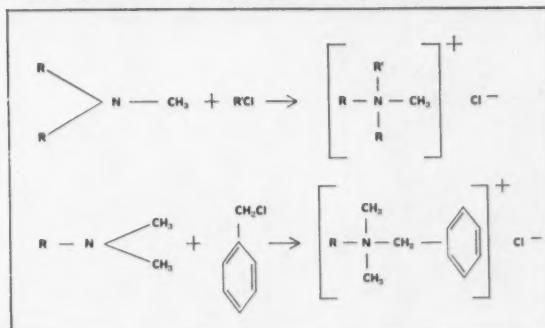
"R" represents the alkyl chains from tallow, coco, soya or the indicated long-chain fatty acids.

### Applications:

**Quaternaries.** Quaternaries made from Armour tertiary amines are used as bacteriostats, germicides, emulsifying agents, textile softeners, and in other applications. And because Armour tertiaries are now reduced in price, processors will find it profitable to make their own quaternaries—particularly those of the benzyl type!

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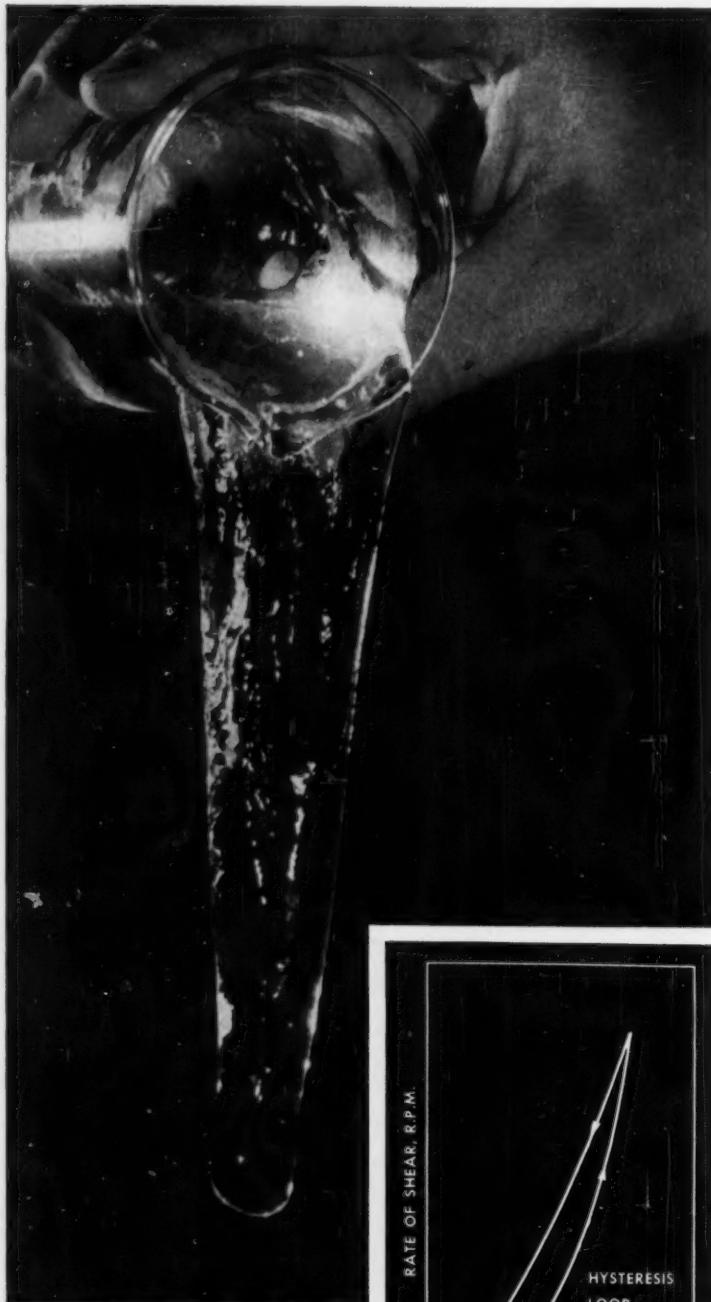
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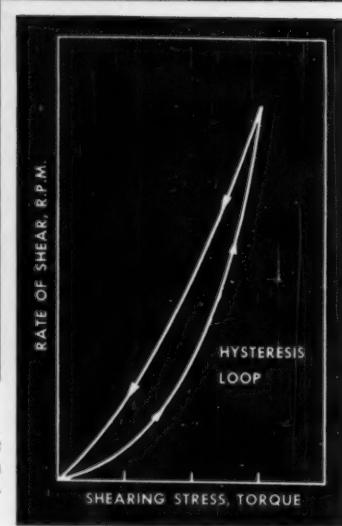
CW-6-59

# THE WIDEST RANGE



## FROM ONE EXTREME...

This unretouched photo shows a thixotropic solution of CMC being poured. Rheogram traces characteristics of a thixotropic CMC-7H solution.



## *Hercules Has the*

Starting with a laboratory curiosity—crude and nonuniform—a Hercules research and production team years ago developed the first commercial purified CMC—cellulose gum. Uniform and stable in price, cellulose gum immediately proved far superior to natural gums in a wide range of uses, and as a result has been in ever-increasing demand.

**THIXOTROPIC**—The first CMC to be made was a thixotropic material. A picture and graph of its solution characteristics are shown on the left. This property is important in many applications; for example, because it thickens on standing, it's ideal for suspending solids in calamine lotion, or pigments in water-based paints.

**NOW NONTHIXOTROPIC, TOO**  
—Advanced research and techniques have made it possible for Hercules to also supply nonthixotropic CMC

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—Full technical data on CMC and assistance in evaluating its usefulness in your existing formulation is available from Hercules. Why not call on the experience Hercules can place at your disposal? For information on how Hercules can help, write:



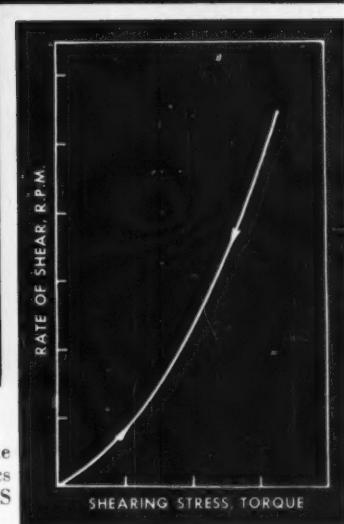
*Virginia Cellulose Department*

**HERCULES POWDER COMPANY**  
INCORPORATED  
900 Market Street, Wilmington 99, Delaware



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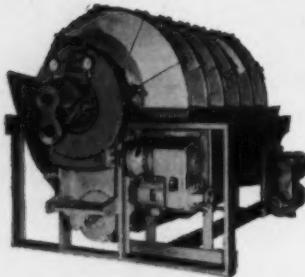
Nonthixotropic CMC solution pours like water. Rheogram illustrates characteristics of a nonthixotropic pseudoplastic CMC-7HS solution.



VC59-1

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**Penetrates rust faster and more thoroughly, dries faster, and gives better protection**

Secret to the remarkable RUSTMASTER performance is a special surface wetting additive\*. This additive gives the vehicle and pigment in RUSTMASTER superior penetrating power through rust which remains after average surface preparation.

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\*Patent applied for

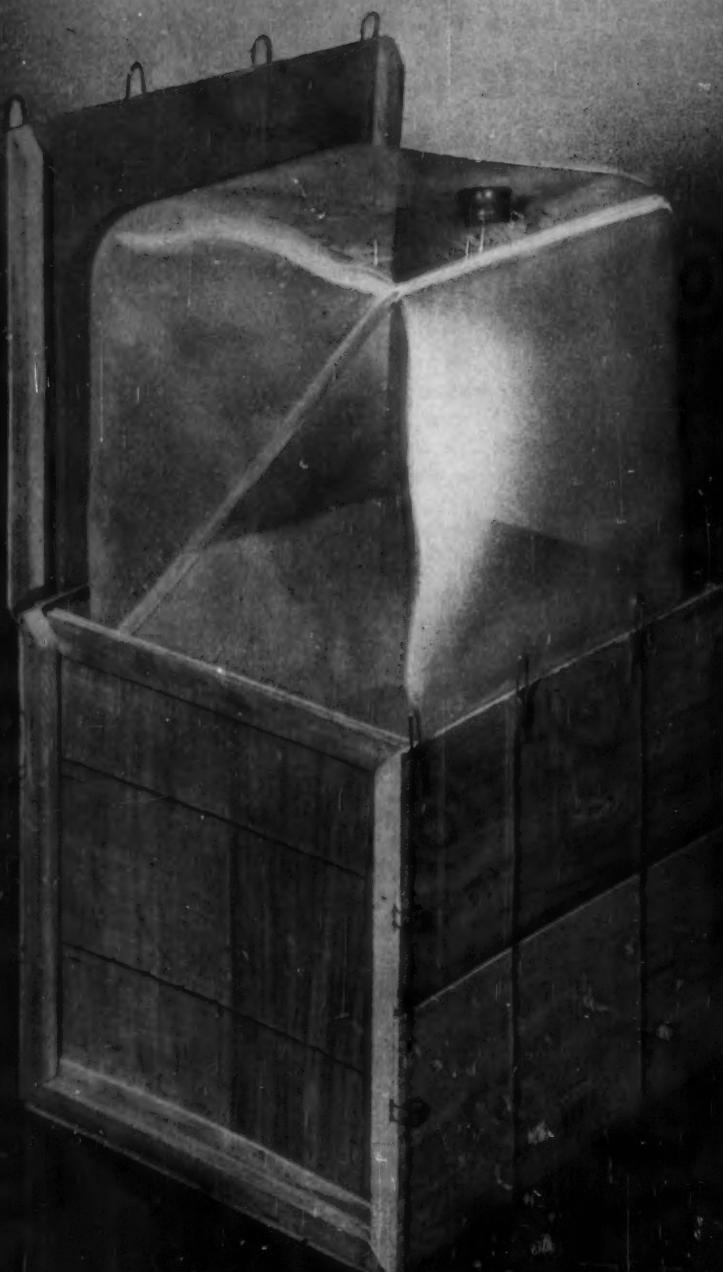


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At Allied Chemical, the heads and hands of many men work toward a single objective:  
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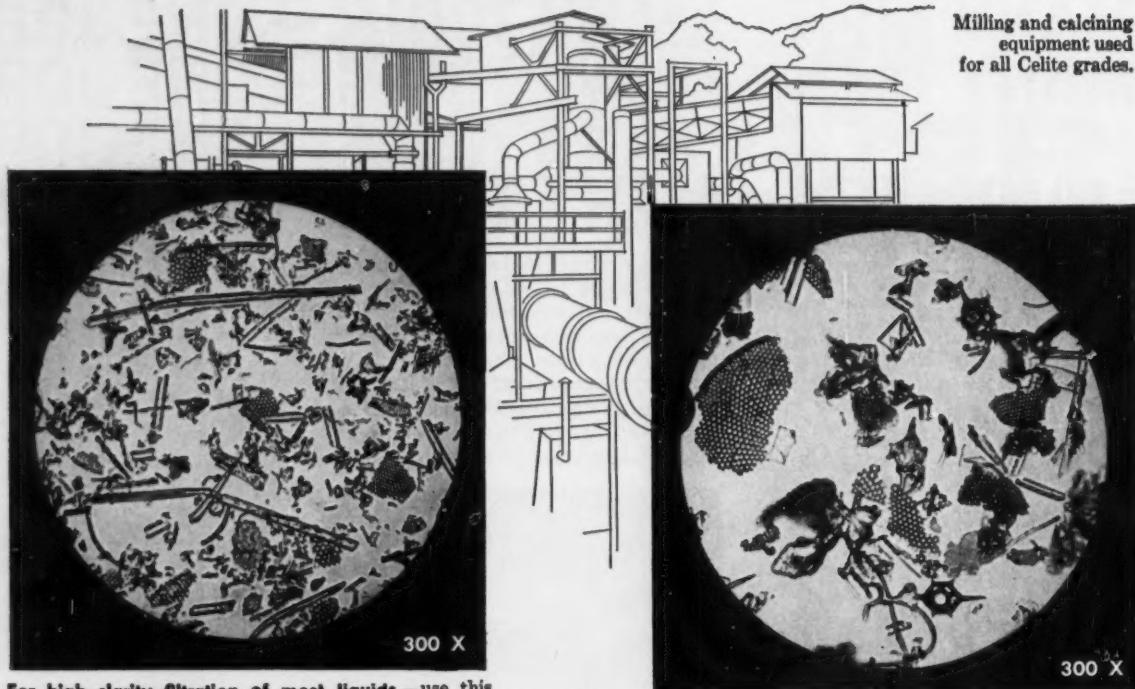
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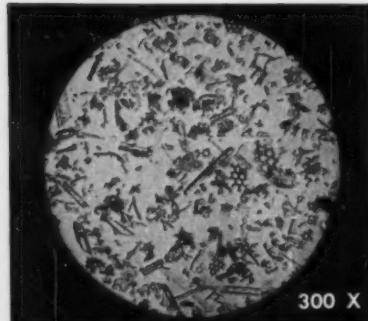
Milling and calcining equipment used for all Celite grades.

For high-clarity filtration of most liquids—use this specially milled diatomite, Hyflo Super Cel.

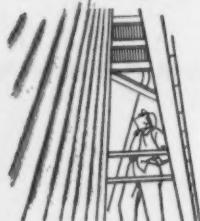
For filtration of larger suspended particles—Celite 545 combines maximum clarity plus faster flow rates.

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## Constant uniformity in every grade of Celite assures consistent results, less down-time



For mineral filler use—Super Floss grade is made up of carefully sized fines air-floated off in the bag house.



Typical J-M bag house equipment.

AS THE MICROSCOPE SHOWS, each grade of Celite\* diatomite has its own distinctive particle size distribution. Yet no matter where or when purchased, each remains uniform from bag to bag—your assurance of top production results with minimum down-time.

Three examples of flux-calcined Celites are shown here. Hyflo® Super Cel is widely used for filtration in many industries. It has just the right combination of coarse and fine particles to assure optimum clarity and flow rates. Celite 545, with a higher percentage of coarse particles, is used to achieve maximum clarity and faster flow rates with liquids that have larger suspended particles.

Super Floss, one of several bag house grades, has fine particle size distribution. A white powder, it is processed within very narrow tolerances (less than 1% retained on 325 mesh). It is a popular filler in fine products such as silver polishes.

Johns-Manville can precision-produce so many different grades of Celite because it mines the material from the world's largest and purest commercially available deposit. For assistance with specific filtration or mineral filler problems, talk to a nearby Celite engineer. Or write direct to Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

\*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

**JOHNS-MANVILLE**



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The recent flight of the amazing X-15 is another giant step forward in man's continuing desire to personally visit other worlds.

At the fantastic hypersonic speed of the X-15, the pilot does not have the strength or rapid response to operate the controls manually—thus making the X-15's controls totally dependent on hydraulic systems during part of the flight pattern. And hydraulic fluids become extremely important.

Oronite's High Temperature Hydraulic Fluid 8515 was selected for the X-15 system. At the intense temperatures created by supersonic flight the Oronite fluid does its job effectively.

This Oronite "first," with another revolutionary new product, indicates again that if you do business with Oronite you will be first with the future.



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## VIEWPOINT

CERTAINLY plastic bags are dangerous. So are household lye, aspirin, abandoned refrigerators, swimming pools, wells, shotgun shells and a great many other products designed for man's comfort and convenience.

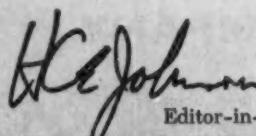
It is regrettable that ignorance and carelessness have led to death by suffocation of several infants who were left within reach of plastic drycleaning bags. The death of a child is heart-rending, and it naturally evokes an emotional response. Such was the response of the North Carolina legislature when, as the result of the death of a Winston-Salem baby, it hastily contrived a bill to outlaw the bags.

But banning the bags is no solution of the problem.

Publicizing the danger—newspaper accounts, warning signs in laundry and drycleaning establishments, warning labels on the bags themselves—is the most sensible approach. (Even so, we must be realistic enough, of course, to realize that accidents will continue; we will never completely eliminate carelessness—children falling or being burned to death when left alone by heedless parents.)

But a warning should be terse and to the point: "Slow—Sharp Curve", "Danger — High Explosives." A placard prepared for drycleaners by the Society of the Plastics Industry is, alas, not terse and is largely beside the point. "IMPORTANT—WARNING TO PARENTS," it starts out. "Plastic film bags are supplied for protection of your garments after cleaning and pressing. The transparency and protective qualities of these bags are most desirable." Now that the "commercial" is out of the way, the card takes an additional 82 words to tell its message.

A later card, prepared by SPI for distribution in New York City, cuts the introduction to two lines, but the warning is still lengthy. We favor such warnings, but let them be terse and telling.



Editor-in-Chief

## OPINION

### Fish Flour, Soy Flour

TO THE EDITOR: I have seen the story [on fish meal (*May 16, p. 88*)].

There is one small error that the fellows in the business will notice, and that is the 15¢ per pound. Of course, the product sells for closer to 8¢ per pound as fish meal; but as fish flour made from whole fish, screened carefully and packaged for human consumption, it would sell for approximately 15¢ per pound.

EZRA LEVIN

President

Viobin Corp.  
Monticello, Ill.

TO THE EDITOR: After reflection on your article "Fleet Nets CPI's Newest Raw Material," I must point out the high-quality protein available in edible soy flours (as high as 60% dry basis protein, depending on type of flour), which are sold in virtually unlimited quantities for as low as 4¢/lb.

M. W. DIPPOLD

Chief Chemist

Spencer Kellogg and Sons, Inc.  
Decatur, Ill.

### School Lab Equipment

TO THE EDITOR: Your solution on laboratory equipment for local schools (*May 23, p. 13*) is excellent.

I feel that large companies should pool their purchases on a national basis. The medium and small manufacturers would have to get together with their neighbors and work on a joint buying program, thus securing a quantity discount from U.S. apparatus makers. . . .

MAURCYC BLOCH

President

The Western Petrochemical Corp.  
New York

### Idea for Small Orders

TO THE EDITOR: How to make money on small orders? Easy. Give them only the paperwork their size justifies. Most companies have a petty cash account. Why not a petty order account with simplified methods?

Use one part- or full-time small-order clerk for all paperwork involved. Order clerk types composite form with shipping labels, packing memo and duplicate, invoices and

duplicates. Sends shipping labels and packing memos to shipping clerk who, receiving duplicate shipping memo, sends out invoices and files duplicate invoices by *date alone*. On receiving payments for petty sales, clerk moves invoices to paid files. Only bookkeeping entries are daily or weekly *totals* of petty sales and payments. Overdue invoices are obvious from method of filing. Clerk sends appropriate letter. No monthly statements or record keeping by *customer*.

Paperwork as above should come to less than \$1 per order.

The same sort of simplification is needed in many organizations in the purchasing department. And they cannot disdain to handle small purchases. . . .

WILLIAM KAPLAN  
Sapon Laboratories  
Valley Stream, N.Y.

### Dressing, Not Oil

TO THE EDITOR: . . . Your article (*May 16, p. 60*) indicates that our Durkee Famous Foods Division had disposed of its salad oil business. This is not correct. We did dispose of our Eastern distribution of table margarine but we are still very much in the salad oil business. . . . We also disposed of our Eastern distribution of mayonnaise and salad dressing. Possibly this led to the confusion with respect to salad oil.

ROGER H. BURGESS  
Legal Dept., The Glidden Co.  
Cleveland

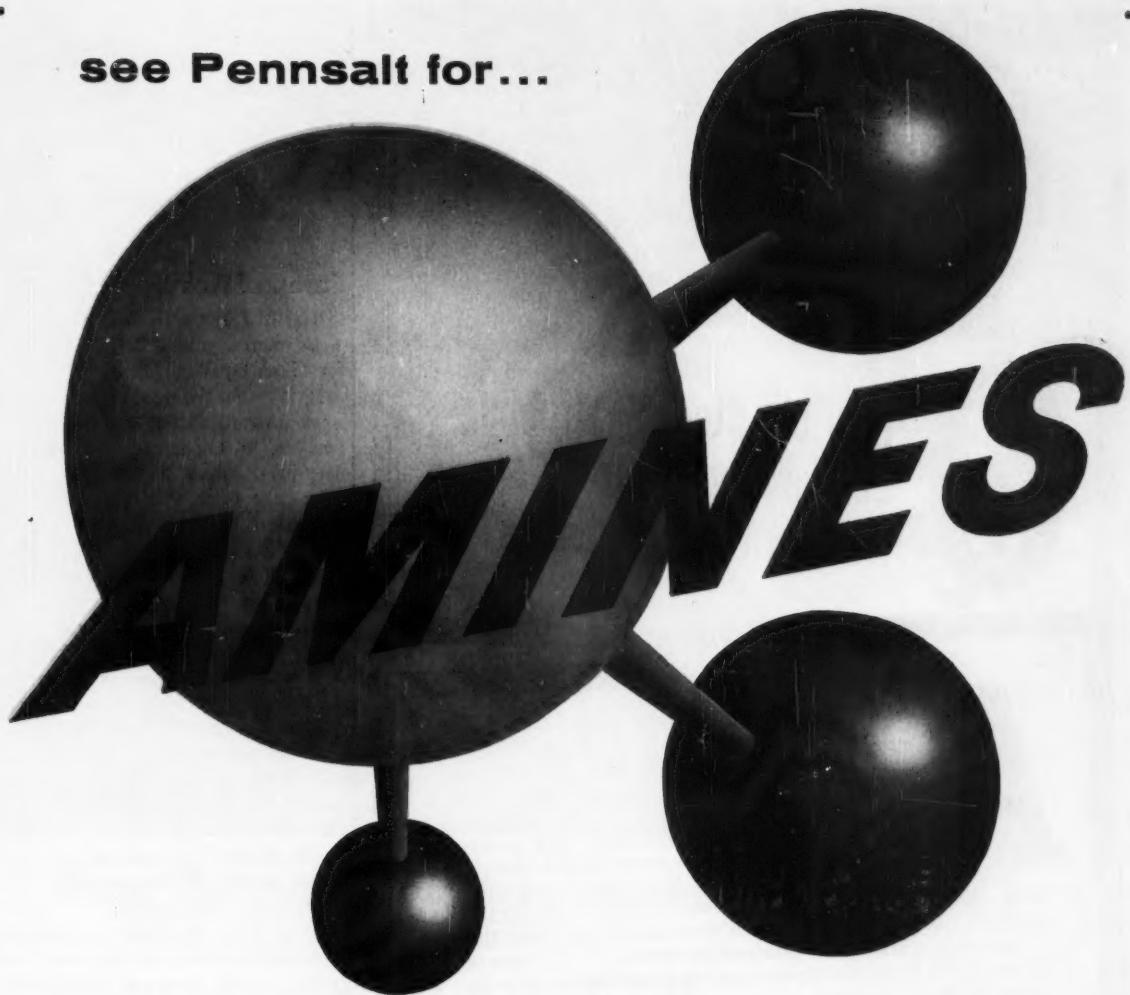
*It did.—Ed.*

### Monobed Is Mixed Bed

TO THE EDITOR: In your article "Clearing the Way for High-Purity Water" (*May 23, p. 76*) . . . our trademark is improperly used. Monobed is our registered trademark for an intimate mixture of Amberlite cation- and anion-exchange resins in a single vessel. In the article, mono-bed is used with reference to a conventional system in which the cation- and anion-exchange resins are contained in separate vessels.

Our company has actively promoted the use of a mixed-bed resins system for the treatment of industrial water supplies since early 1950. The following U.S. patents covering this field

see Pennsalt for...



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**ETHYL**

**PROPYL**

**BUTYL**

**AMYL**

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Only PENNSALT gives you the top economy of getting C<sub>1</sub> to C<sub>5</sub> alkyl amines from one source . . . plus a large family of their derivatives. Our high production capacity assures you ample quantities, fast deliveries. And our long experience in producing amines guarantees highest quality. Write or call us about your amine needs, and for technical data or assistance on amines.

See our Catalog in Chemical Materials Catalog

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Chemicals**

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## PLANT LOCATION QUIZ



# Q

**Why did Steel Scaffolding  
Company move to  
WESTern PENNsylvania?**

# A

(1) *100% Financing at Low Interest*—all details of building and financing the plant handled by the community nonprofit industrial development corporation. (2) *A Friendly Community*—cooperative attitude of the people and local civic groups. (3) *Room to Grow*—away from a crowded eastern metropolis to an area with ample

room for future expansion. (4) *Skilled Labor*—a plentiful supply of dependable workers always available. (And they are already setting new production records!) (5) *Accessibility*—close to steel suppliers and raw materials and in the heart of major markets.

# W

RITE TODAY

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an operating unit of the WEST PENN ELECTRIC SYSTEM



WEST PENN POWER, Area Development Department CW-11  
Cabin Hill, Greensburg, Pennsylvania

Yes, I'm interested in WESTern PENNsylvania:

Please contact me in strict confidence. Phone \_\_\_\_\_  
 Please send booklet, "Plant Location Services."

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Company \_\_\_\_\_ Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## OPINION

have been assigned to Rohm & Haas Co.: 2,461,505, 2,461,506, 2,578,937 2,578,938 and 2,692,244. . . .

ROBERT P. GOODALE  
Advertising Manager  
Rohm & Haas Co.  
Philadelphia

## Europe Likes Deep Colors

TO THE EDITOR: We read with great interest your article "New Help for Glass Dyes" (May 2).

It is probably one of the biggest steps forward that it has been made possible to impart to glass textiles deep-hued colors. In that respect, we must take issue with the spokesman of United Merchants Industrial Fabrics who states that "there has been little call for deep-hued glass textiles."

This statement may be true when applied to the American market, but it is wholly inaccurate as applied to the European clientele. We have been occupied with the introduction of U.S.A.-produced glass decorative textiles in several countries on the European Continent and find that, while the lighter "pastel" colors are very much admired, the question is always asked, "Can't you show us some dark, deep, really vivid colors?"

Thus, any processes that permit such darker colors and that meet the rather severe tests of washability, lightfastness (always realizing we are speaking of glass textiles) and the like, will be more than welcome.

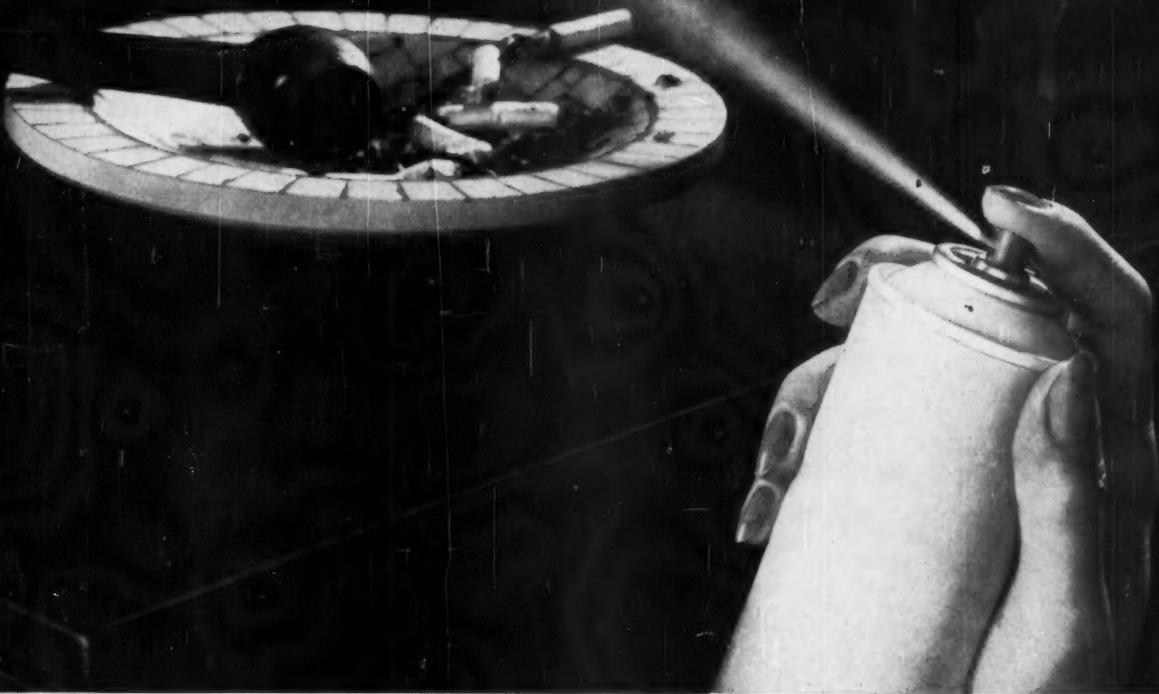
CHEMACID  
4, Rue De L'ecuyer  
Bruxelles 1, Belgium

## MEETINGS

**Gordon Research Conferences:** At Colby Junior College, New London, N. H.—catalysis, June 29-July 3; polymers, July 6-10; textiles, July 13-17. At New Hampton School, New Hampton, N. H.—proteins and nucleic acids, June 29-July 3; magnetic resonance, July 6-10; organic reactions and processes, July 13-17. At Kimball Union Academy, Meriden, N. H.—nuclear chemistry, June 29-July 3; solid-state studies in ceramics, July 6-10; chemistry, physiology and structure of bones and teeth, July 13-17.

**Society of Chemical Industry**, 78th annual meeting, Glasgow, Scotland, July 6-11.

**American Soybean Assn.**, 39th annual convention, Sheraton-Jefferson Hotel, St. Louis, Mo., Aug. 11-12.



## Aerosol packaging captured 67% of the \$47,000,000 room-deodorant market

If your product can be brushed, poured, sprayed or squeezed, this profitable new packaging idea can generate sales for you, too!

A runaway in room-deodorant sales started in 1953 after the aerosol-packaged product was introduced. By 1957 total sales were up to \$47,000,000, and the aerosol form accounted for \$31,500,000 of this.

The reasons for this success are simple. Aerosols deliver the product in a completely new form that's easier, more effective and often more economical to use. If your product can be brushed, poured, sprayed or squeezed, you stand a good chance to add new sales appeal—create vast new markets—if you package it in an aerosol.

**It is not necessary to set up your own packaging line** to enter this field. A custom filler near you has the knowledge and equipment to help in every area, from planning through production.

If you don't know the name of a custom filler, write Du Pont. We'll send you a list and include survey data on your market for aerosol products, plus information about Freon® propellents for aerosols. "Freon" is preferred by custom fillers and is used in more of today's aerosols than any other propellent. Write E. I. du Pont de Nemours

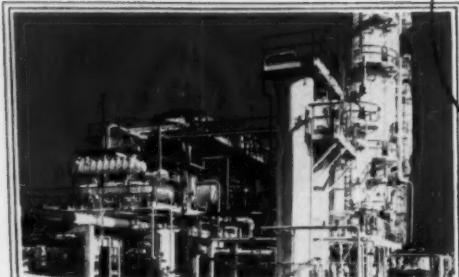
& Co. (Inc.), "Freon" Products Division  
336, Wilmington 98, Delaware.

*Best-selling aerosols are powered with*

**FREON®**  
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**DU PONT**  
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



ITALY — 10,000 metric ton/yr phthalic anhydride plant now being handled for ACNA in Cengio.



## Around the world, engineering projects of note bear the Badger Stamp

CANADA — tar distillation plant for Dominion Tar and Chemical Company, Limited, Hamilton, Ontario, Canada.



Badger affiliates and sales and field offices approach world-wide status. Through these well-established and rapidly expanding facilities, Badger is currently engineering and constructing more than twenty-five major projects for local, regional and international clients in the petroleum, chemical and nuclear energy industries.

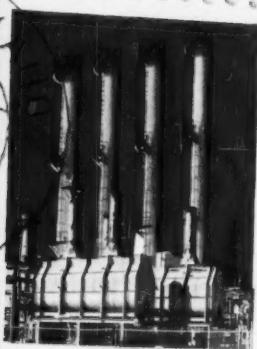
Considering a plant project in this country? . . . or abroad? Call on Badger for proven ability and experience available on-the-spot . . . anywhere. For more information write or call today. Badger Manufacturing Company, 363 Third St., Cambridge 42, Massachusetts.

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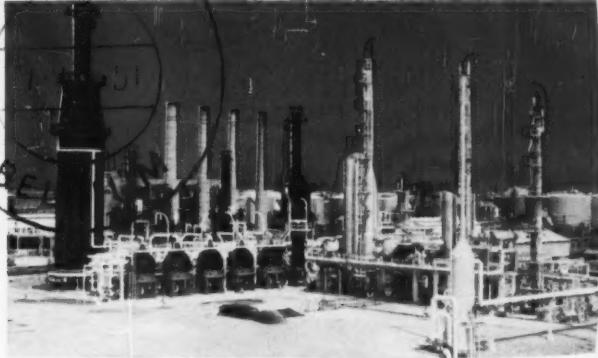
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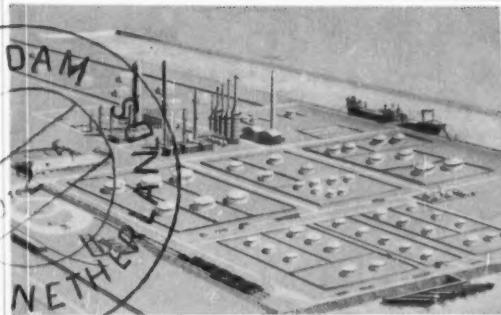
BELGIUM — Powerformer-Hydrofiner and miscellaneous offsite facilities recently completed for Esso Standard Refinery S.A. in Antwerp.

ARUBA  
ARUBA

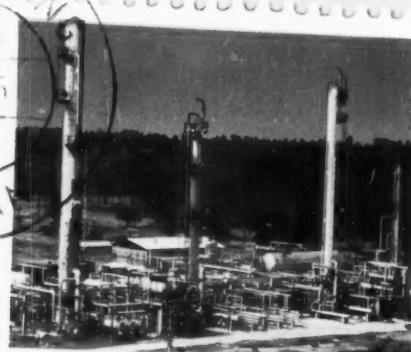
ARUBA — distillate treating unit for Lago Oil & Transport Company recently completed by Badger.



ROTTERDAM  
THE NETHERLANDS



THE NETHERLANDS — complete 100,000 bpsd "grass-roots" refinery under construction for Esso-Nederland N.V. in Rotterdam.

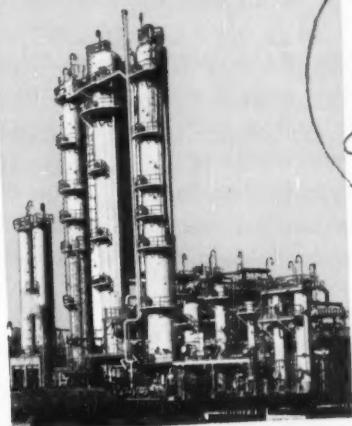


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UNITED STATES — benzene unit engineered for Gulf Coast refiner. Produces 24 million gallons of purified benzene annually.

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## The magic of Owens-Illinois designers turns any stock bottle into a special container for you!

Through the magic of O-I designers, any of the thousands of stock bottles on their shelves can be turned into a special container designed *exclusively for your product*.

The glass container best suited for your needs becomes an econom-

ical, sales-attracting package . . . gives your product the selling advantages on store shelves.

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# Business Newsletter

CHEMICAL WEEK

June 27, 1959

## Three major expansions highlight the news:

(1) Tennessee Eastman is boosting capacity of its Kingsport, Tenn., Kodel polyester fiber plant to more than 200 million lbs./year. Construction, already under way, is scheduled for completion by mid-'60.

(2) Another fiber maker, Chemstrand Corp., has just revealed plans for a 10-million-lbs./year nylon yarn plant near Greenwood, S. C. Construction will start immediately, with completion scheduled for '60. Cost: "in excess of \$5 million."

(3) And Air Products (Allentown, Pa.) will build a 650-tons/day oxygen plant for Weirton Steel Corp.—with output to be used for boosting steel production in open-hearth furnaces.

## It's another chemical acquisition for W. R. Grace & Co.

Hatco Chemical Co. (Fords, N. J.) will become Grace's sixth chemical operating division in the U. S. Terms of the transaction: Grace to issue 126,000 shares of its common stock (valued at about \$6 million) in exchange for all Hatco assets; additional Grace shares may be issued later, depending on future earnings of the Hatco unit. Hatco will continue to produce plasticizers, synthetic lubricants and other products at the same site and under the same management.

Of the 126,000 Grace shares in the initial issue, 125,832 will go to Hatco's president and principal owner, William Hackman.

Look for some administrative reshuffling in Celanese Corp.'s chemicals and plastics divisions. In a move to more closely coordinate the two operations, chemical chief R. W. Miller is expected to take over the top managerial duties for both divisions.

Organizational details of Century Chemical Corp., formed last fall (*CW*, Oct. 18, '58, p. 25), are more clearly defined this week.

In a preliminary prospectus, covering a proposed \$300,000 stock offering, it's revealed that Century plans to acquire voting control of Wilson Organic Chemicals Inc. (Sayerville, N.J.) and all the outstanding stock of Chemo Puro Manufacturing Co. and Oil and Chemical Terminals Inc. (Newark, N.J.), plus some machinery and other facilities—owned by Chemical Products Inc.—now located on Terminals' property. Additional financing planned: \$5.2 million.

Through these acquisitions, Century will produce organic dyes and pigments as well as more than 100 chemicals used in specialty, drug, rubber, textile, agricultural and other industries.

## Business

### Newsletter

(Continued)

#### Latest CPI financial news is generally bullish.

Cash dividends paid by chemical companies through May 31 were up 2.5%—\$281.4 million this year vs. \$273.5 million in the first five months of '58. Petroleum companies boosted their cash dividends 2.1%, but dividend payments by producers of nonferrous metal were down 11.6%. The all-manufacturing average: up 2.6%.

"Sharp gains" in net income and in divisional sales are reported by The Glidden Co. for the first nine months (ended May 31) of its '59 fiscal year. Board Chairman Dwight Joyce credits record sales in paints and chemicals, pigments and metals for the rise in earnings: from \$3.8 million in the year-ago period to \$5.2 million for the past three quarters.

•

**Greatly stepped-up use of aluminum in autos** is heralded this week. Chryslum Ltd., newly formed subsidiary of Chrysler Corp. and Aluminium Ltd., will lease a 36,000-tons/year aluminum smelter at Beauharnois, Que., to supply ingots to Chrysler plants in the U.S. and Canada. Chrysler of Canada will own a controlling interest in Chryslum; Aluminium will own and operate the Quebec smelter. In addition, Chrysler of Canada is planning a new aluminum die-casting plant at Windsor, Ont.—which will use Chryslum-supplied ingots.

Implied, say industry people, are fast-materializing plans for large-scale output of aluminum engine blocks.

So far, the two largest U.S. aluminum producers—Alcoa and Reynolds—haven't revealed comparable deals with auto makers.

•

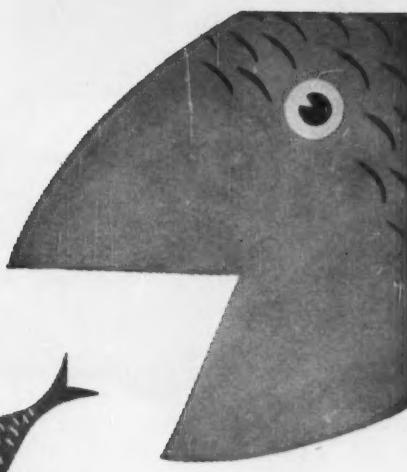
**Expansion in resin materials is continuing**, but on a more cautious and selective basis than in recent years.

• American Cyanamid will build a 10-million-lbs./year melamine crystal unit next to its molding compound plant and development laboratory at Wallingford, Conn. The new facility—using "an improved process"—will go onstream early next year, supplement Cyanamid's melamine production at Willow Island, W. Va.

• Reichhold Chemicals' Canadian affiliate will build a 15-million-lbs./year unit at Port Moody, B.C. (near Vancouver). (Dow of Canada—first with plans for making phenol in western Canada—has just decided on Fort Saskatchewan, Alta., as the site for its phenol, caustic and chlorine plant.) This will not affect RCI's plans for a 30-million-lbs./year phenol plant at Tacoma, Wash.

**And Reichhold is getting a new market for one of its resins.** RCI President Henry Reichhold has purchased—for \$1.5 million—the Bluebeard's Castle resort hotel on St. Thomas, Virgin Islands. He plans to erect prefabricated tourist cottages made largely of glass-fiber plastics.

## SODIUM DISPERSIONS



**the smaller they are...the faster they react!**



The smaller the size of sodium particles, the greater their reactivity...and results.

By exposing far greater surface area, sodium dispersions speed up reaction time, increase yield, and give far better control of processing.

Among the many specific reactions using dispersions are:

- Preparation of sodium alkoxides • Purification of hydrocarbons • Claisen condensations • Preparation of organo-

sodium compounds • Wurtz type reactions • Metalations  
• Polymerization catalyst • Reduction of metal halides

One of our experienced Chemical Engineers can assist you to evaluate reactions or help in the preparation of your own dispersions. He will also be glad to discuss with you the latest procedures for manufacturing, storing, diluting, and handling dispersions.

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CW 6-27-59



## Patching and surfacing compounds formulated with **Versamid®** resins are stronger than concrete itself!

What a beating this garage floor takes from tractor lugs, tire chains, chemicals, salt, grease and the weight of multi-ton vehicles. But patching and resurfacing is simple, quick and inexpensive with Versamid polyamide resins.

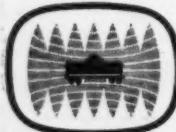
The Versamid reactive series (100, 115, 125, 140) combine with epoxy resins and ordinary sand. This formulation trowels like concrete, feathers smoothly, and maintains its adhesion in layers as thin as  $\frac{1}{16}$ -inch! *And the bond is stronger than the internal strength of concrete itself.*

For topping, patching, or complete resurfacing, Versamid-based compounds provide surfaces that can be smooth as glass, or textured where traction is required. Proven uses already include highways, runways and non-skid approaches to bridges.

Only **Versamids** offer all these advantages:

- Fast cure time
- Non-critical proportions
- Compatibility with a wide range of fluid epoxy resins
- Non-toxicity
- Outstanding adhesion
- Chemical and solvent resistance
- Unusual durability

**Note:** General Mills does not make patching compounds, only the Versamids that improve them. For complete technical details and Versamid specifications, write: Dept. CW46.



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# CHEMICAL DIVISION

KANKAKEE, ILLINOIS

SALES OFFICES: New York, Boston, Philadelphia, Charlotte, Chicago, Kankakee, Houston, Los Angeles, San Francisco



June 27, 1959

## Betting Heavily on Fibers Boom

Add another name to the growing list of present and prospective acrylonitrile producers, whose construction plans would put 1961 capacity four years ahead of demand. Last week, Du Pont took a step that has long been a lively rumor. The company said it will start immediately to build a multimillion-dollar acrylo unit at its Memphis, Tenn., Electrochemicals Dept. plant. Probable capacity: 30 million lbs./year.

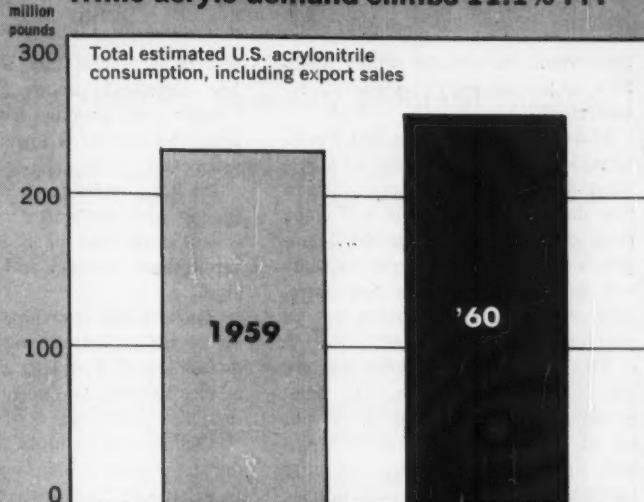
Du Pont's Orlon synthetic fiber plants at Camden, S.C., and Waynesboro, Va., are the largest users of acrylo; their present combined intake is about 90 million lbs./year. Up to now, Du Pont has been buying all of its acrylo requirements—largely from American Cyanamid, Monsanto and Union Carbide, the three principal producers.

**Beyond the Horizon:** And there are indications that another Du Pont acrylo plant may be just beyond this month's horizon. While the Memphis unit is to be based on an acetylene-plus-hydrogen cyanide process researched by the company's Electrochemicals Dept., there has been recurring talk in the trade that Du Pont's Explosives Dept. may be planning to add an acrylo unit at its Beaumont, Tex., plant. This unit would use propylene-plus-nitric oxide process on which the company received a patent (U.S. 2,736,739) several years ago.

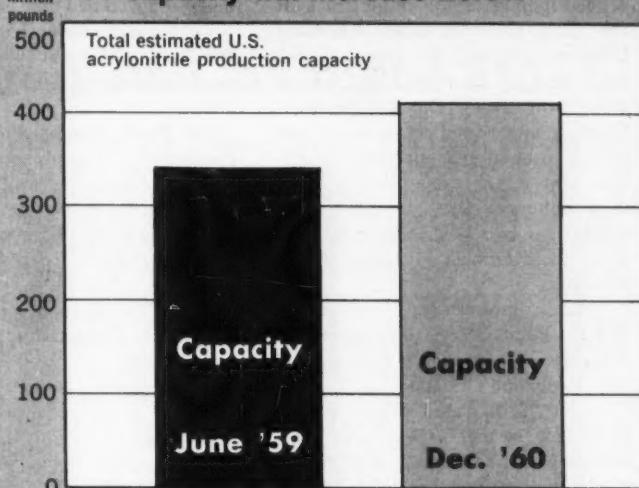
Worth noting: (a) the Explosives Dept. is now building at Beaumont a caprolactam plant that may use nitric oxide as a principal intermediate, along with cyclohexane; (b) Socony Mobil Oil Co. is building—also at Beaumont—an olefin plant that will be able to produce more than 100 million lbs./year of 99%-minimum-purity propylene; and (c) Du Pont reportedly has asked Socony for an estimate on supplying 20 million lbs./year of high-purity propylene (which would be equivalent to about 25 million lbs./year of acrylonitrile).

If both Du Pont acrylo plants are built,

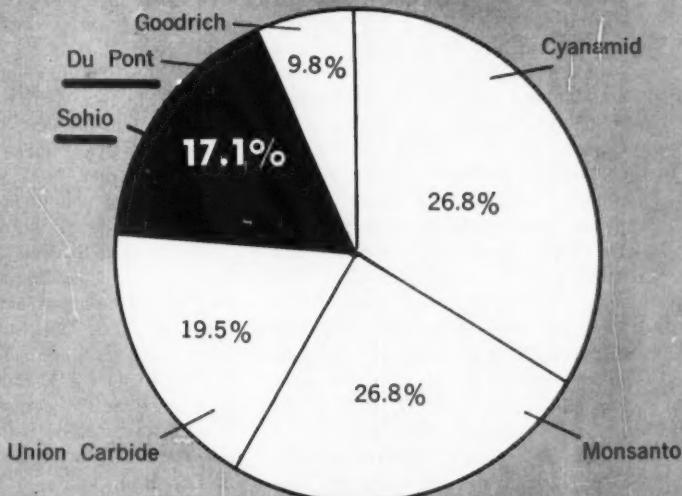
While acrylo demand climbs 11.1% . . .



. . . Capacity will increase 20.6%



Capacity boosters: two new producers.



they would be able to supply about 50% of the company's own acrylo requirements.

**Materials at Memphis:** Du Pont's formal statement concerning the acrylo plant to be built at Memphis states that the hydrogen cyanide will come from existing facilities at the Memphis site. Hydrogen cyanide capacity will be expanded for the new operation. Acetylene requirements will be purchased.

This latter point, however, has not yet been decided upon. Du Pont is mulling over a decision to (1) put up its own acetylene plant at Memphis, or (2) give the nod to a potential newcomer in acetylene production as its permanent supplier.

W. R. Grace & Co. is generally conceded to have the inside track at this time, since its Grace Chemical Division operates a big ammonia and urea plant at Memphis, less than a mile away from Du Pont's tract. Grace is understood to be ready and willing to build and operate an acetylene unit if Du Pont offers a long-term contract. Such a unit—using natural gas as a feedstock—might require an investment in excess of \$20 million.

Initially, however, it's a good bet that Du Pont's acetylene requirements will derive from calcium carbide, and Air Reduction's facility at Calvert City, Ky., is the most logical source of carbide in that general area. The carbide would be shipped to Memphis and acetylene generated either by the supplier or by the consumer.

**Pride in the Process:** For the past year or more, both the traditional starting materials in acrylo production—ethylene oxide and acetylene—have been passed over by researchers looking for more economical routes to acrylonitrile. Examples: a German method starting with acetaldehyde and hydrogen cyanide, said to cut costs by 25%; and a bevy of propylene-based processes worked out by Du Pont, Escambia Chemical, and various oil companies—including Standard Oil of Ohio, whose Sohio Chemical Division has just described the propylene-ammonia-air reaction to be used in the acrylonitrile plant it's building at Lima, O. (CW Technology Newsletter, June 20).

But Du Pont's Electrochemicals Dept. says it will be using an "improved" version of the classic acety-

lene-HCN process. Says a spokesman: The improved process will give a "higher yield, produce fewer by-products, and require a lower capital investment."

Du Pont, understandably, is not revealing what the cost-cutting wrinkle is, but more than likely it involves a vapor-phase reaction and a new catalyst.

Also entering into the economics of the Memphis project: captive, on-site production of hydrogen cyanide with new equipment, and economical over-the-fence acetylene.

The decision to utilize this process, the department adds, "was based on an exhaustive study over the past few years of all possible methods" of producing acrylo. Completion of the new unit—scheduled for late next year—will create about 65 new jobs at Du Pont's Memphis plant, bringing total employment there to more than 500.

**No Panic Among Producers:** Du Pont's move to supply some of its own acrylo requirements evoked no signs of consternation on the part of the other producers. In general, they told CW, they don't expect the price of acrylo to falter in the near future, and they are all counting on a steady increase in demand for this versatile intermediate.

Even Sohio, whose Lima plant probably won't be onstream before next spring, isn't visibly distressed. For one thing, says Sohio Vice-President Ed Morrill, "the Du Pont announcement was not entirely unanticipated." Also, Sohio's plant is already pretty well along in construction.

And the entire industry derives some comfort from the fact that Du Pont's Memphis unit will be relatively small. In fact, its maximum output probably will be less than that of American Cyanamid's old acrylo plant at Warner, N.J., which is now totally out of commission, all equipment having been removed.

**One Project Shelved:** Dow Chemical says it is "holding in abeyance" its plan to build an acrylo plant at Freeport, Tex.; but this is nothing new. Two years ago, Dow was intending to have a 35-million-lbs./year plant onstream by early '59; but this project was shelved before construction started. Dow's Zefran fiber plant at Lee Hall, Va., is a growing consumer of acrylo, but apparently the

company is satisfied to be a buyer in the present acrylo market.

All four of the companies actually in acrylonitrile production have been expanding. Monsanto launched the expansion wave by upping its capacity at Texas City more than 80%—from 60 million to more than 100 million lbs./year. Cyanamid boosted its capacity at Fortier, La., from 50 million to more than 100 million lbs./year, bringing capital investment at that plant to \$80 million. Union Carbide doubled the capacity of its formerly 35-million-lbs./year plant at Institute, W. Va.; and Goodrich Chemical has gradually increased the rating of its plant at Calvert City, Ky., from 24 million to about 40 million lbs./year.

Three of those companies—like Du Pont and Dow—have a direct stake in the acrylic fibers business, which is the big outlet for acrylonitrile now and is expected to keep growing at a faster clip than any other acrylo-based business. Monsanto is 50% owner of Chemstrand, whose Acrilan fiber ranks next to Orlon in sales volume; Cyanamid is backing its Creslan fiber, now third in this field; and Carbide makes Dynel and reportedly may be preparing to put another acrylic fiber on the market. Tennessee Eastman also has an entry, Verel fiber, and has studied the question of producing acrylo, but like Dow is continuing as a buyer.

Virtually all of the output of the Goodrich acrylo plant goes into N-type synthetic rubber—a product that appears destined for continuing sales growth, but at a gradual rate. Producers expect somewhat more rapid rises in acrylo's uses in the plastics and paper industries; and they see good prospects for acrylo derivatives—such as acrylamide—in mining chemicals, adhesives and paper chemicals. Some acrylo has been moving to Europe, but exports will dwindle as new plants start up overseas.

But for the big share of the hoped-for 15-20% annual growth in acrylo demand, producers are banking very heavily on acrylic fibers. Certainly the fibers are the prime factor in this year's pickup in acrylonitrile shipments. While '58 sales ran to about 180 million lbs., acrylo has been moving this year at an annual rate of nearly 230 million lbs.—an indicated gain of more than 27%.

## Aim: Vertical Growth

In their first appearance before the New York Society of Security Analysts, Witco Chemical Co.'s top management men last week sketched their plans for growth. Their formula: concentrate on developing present product lines; integrate vertically into basic chemicals, preferably through acquisition.

Of its present line, President Max Minnig said, Witco sees the greatest promise in polyesters, detergent intermediates, liquid detergents, and in some new emulsifiers. In organic chemicals, Witco is pinning its biggest hopes on polyester resins for urethane foams. Despite the advances of the polyethers, the company believes polyesters will continue to have an edge in particular applications, such as rigid foam.

Witco's biggest new project is the 20-million-lbs./year phthalic anhydride plant now starting up in Chicago. The plant was due onstream during the first quarter, but equipment problems have delayed full production. At Hawthorne, Calif., a Witco subsidiary, Ultra Chemical Works, is spending \$250,000 for a toluene-xylene sulfonation plant that will provide the basic intermediate for heavy-duty liquid detergents.

Through Continental Carbon, Witco also has a major stake in carbon black (Witco owns 20%, is exclusive distributor; Continental Oil and Shamrock Oil are the other owners). By 1960, when current construction in the U.S. and France is completed, Continental will have a total capacity of 300 million lbs.—50% above the present level.

To distribute Continental's French output, and to serve as a base for Witco's future expansion in the "Common Market," the company plans to set up a subsidiary there.

Witco's sales, says Board Chairman Robert Wishnick, will hit about \$24 million in the first half of the year, 30% over the first half of 1958.

Operating profits are expected to be up 25%, after deducting a nonrecurring cash distribution from the '58 half's total.

Of total sales, the organic chemical division and Continental each account for 30%; Ultra, 25%, and the Pioneer Division's asphalt products, 10%.

## General Dynamics' Growing Chemical Empire

	PRODUCTS	STATUS	INVESTMENT
<b>These companies have already been acquired:</b>			
<b>Liquid Carbonic</b>	Industrial, medical gases	Merged Sept. '57	\$61.3 million in stock
<b>Hench</b>	Industrial, medical gases	Acquired June '59	"Several million dollars"
<b>These ventures are in the works:</b>			
<b>Dynamics Reading</b>	Chemicals from anthracite waste	Revealed agreement for joint venture	\$50-75 million
<b>Company unknown</b>	Chemicals, other products	Acquisition talks in advanced stage	\$125-150 million, largely in stock
<b>Company unknown</b>	Petrochemicals, plastics	Negotiations on: settlement about six months off	

## Uppling Its Chemical Stake

The chemical industry may soon find itself with a new giant in its midst. General Dynamics, already a colossus in the defense field ('58 sales: \$1.5 billion; profits: \$71.5 million), is now taking long strides into the CPI. Dynamics' aim: to balance its military earnings with commercial profits.

Dynamics' newest move in this direction was its acquisition of the Hench industrial and medical gas companies, revealed last week by Rex Nicholson, president of the Liquid Carbonic Division. The purchase is a rounding-out of Dynamics' first step into chemicals—the merger with Liquid Carbonic in '57.

And last month, Dynamics and Philadelphia & Reading Corp. revealed plans for a \$100-million joint venture to produce chemicals from anthracite coal wastes (*CW*, May 23, '59, p. 21).

But these are only Dynamics' first strides into the chemical industry. According to a reliable source, Dynamics intends to have four big chemical entities operating under Nicholson—Liquid Carbonic, Dynamics Reading and two others: a soon-to-be-acquired producer of chemicals and other products, with assets valued at \$125-150 million; and a petrochemicals and plastics production company, to be set up as a joint venture with a major oil producer.

Merger with Liquid Carbonic gave Dynamics a network of industrial and medical gas (carbon dioxide, hydrogen, oxygen, nitrogen, argon) plants west from Ohio and abroad. Last year, it picked up Industrial Air Products of the South, producer and distributor of oxygen and acetylene.

Hench spreads Dynamics' gas operations to the East, with 17 plants: two hydrogen plants, an acetylene unit and an oxygen plant in New England; a hydrogen plant, two gaseous oxygen facilities, a unit to make liquid oxygen, nitrogen and argon, and acetylene and nitrous oxide plants in the New York area; two oxygen facilities and an acetylene plant in Pennsylvania; oxygen and acetylene units in Ohio; and oxygen and acetylene plants in Florida.

For a short period, Dynamics will operate the Hench firms under their various corporate names. Eventually, they will be absorbed by the Liquid Carbonic Division.

**More to Come:** The chemicals-from-coal venture, though it has been agreed to in principle, still awaits what has been called further "explorations" before it's launched. The plans call for a plant at Pottsville, Pa. Liquid Carbonic would handle management and sales. If the project materializes, it will strengthen Dynamics' position in hydrogen and acetylene, and add to its line ammonia, ammoni-

um nitrate, urea, nitrogen solutions, methanol, calcium carbide and vinyl chloride.

But the biggest steps are yet to come. This week, Dynamics' board of directors will be discussing details of the proposed chemical company acquisition, which would involve both stock and cash transfer.

One possibility: General Aniline. Dynamics has been reported negotiating with Interhandel to buy all or part of the Swiss holding company's portfolio. If such a deal is in the works, it would have to await a decision by the U.S. government that Interhandel is the rightful owner of the General Aniline stock now being held as an enemy asset.

Dynamics is preparing to enter the petrochemical field in a major way, CW has learned. Negotiations are on with a major oil company for a joint venture that would tie in with the oil company's products and processes. Plans include production of ethylene on a large scale and of plastics—probably including polyethylene. Arrangements will likely be concluded in another six months.

For the more distant future, Dynamics is interested in metallurgy, including a direct hydrogen reduction process to make sponge iron.

### Home-Town Expansion

**Victor Chemical Works is blueprinting a bulk-chemicals production unit on the banks of the Little Calumet River in Chicago, Ill.**

The site is a 35-acre tract just inside the southern limits of the city—near the connecting link between Lake Calumet and the Sag Canal.

First phase of the project will be a phosphoric acid plant, slated for completion in time to supply the 1960 demand for liquid plant food.

The second step, still under study by Victor, will be a unit to make phosphates for broad applications in detergents, foods, etc.

The plant, using elemental phosphorus as a basic raw material, will be similar in design to one just completed by Victor in Morrisville, Pa.

The Chicago site was selected, says Victor President Rothe Weigel, because of transportation advantages, both from the standpoint of incoming raw materials and the shipping of products.

### CPI Earnings: The Trend Is Mixed

	Sales			Profits		
	1st qtr. '59 (\$ million)	Change, 4th qtr. '58	Change, 1st qtr. '58	1st qtr. '59 (\$ million)	Change, 4th qtr. '58	Change, 1st qtr. '58
Chemicals and allied products	6,382	1.7%	18.2%	494	3.8%	42.8%
Paper and allied products	2,741	-1.8%	8.0	136	-8.1	24.7
Rubber products	1,970	-2.5%	16.5	76	-5.0	105.4
Primary nonferrous metals	2,256	4.9%	24.3	135	8.9	57.0
Stone, clay and glass products	1,827	-9.3%	17.4	104	-29.2	147.6
Petroleum refining and related industries	6,604	1.9%	9.5	662	-16.1	23.4

Based on figures compiled by Securities & Exchange and Federal Trade commissions.

### CPI Profits Under Pressure

**Although over-all chemical sales are rolling along on their post-recession upswing, just-released government figures reveal sputtering earnings in other segments of the CPI.**

The primary nonferrous metals category led the process industries in first-quarter sales. Spur: booming aluminum demand. Surging aluminum sales may be due—at least in part—to stockpiling in anticipation of an aluminum strike and price boost this summer.

**Bucking the Trend:** The rise in chemical earnings, while less dramatic, reaffirms the industry's above-average recovery from last year's recession lows. Average earnings by all manufacturing corporations slipped 5.6% below the prior quarter. Chemicals and allied products chalked up a 3.8% gain.

The increase wasn't shared equally, however. Profits from sale of basic chemicals dropped to \$266 million—off 1.1% from '58's final three-month period. Rising incomes from drug and other chemical sales helped offset the decline.

Other data from the government's quarterly financial report for U.S.

manufacturing corporations show mixed performances elsewhere on the balance sheets. Chemical and allied products' cash dividends charged to surplus totaled \$257 million in this year's first quarter, compared with \$252 million in the first quarter of '58, while total stockholders' equity rose to \$15,219 million vs. \$13,773 million, a one-year gain of 10.5%.

**Rise in Reserves:** In the first quarter, total depreciation in chemicals and allied products amounted to \$272 million, compared with \$241 million in the preceding three months. And these companies had net working capital totaling \$6,735 million, as of March 31 vs. \$6,074 million one year earlier.

All CPI companies' performances were influenced by seasonal factors. But perhaps most susceptible are the makers of stone, clay and glass products, who sell in big volume to the construction industry, which, in turn, does most of its business in the second and third quarters.

Nevertheless, the new quarterly report clearly demonstrates that profit margins are still under heavy pressure, despite rising sales volumes.



Syrup  
for soda  
is one  
example

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many kinds of closures, in carbon or stainless steel. Carbon steel containers are available with regular or special linings. Find the right steel shipping container for your product in the largest and most varied line available . . . the USS line.

**Plants and Sales Offices:** Los Angeles, Alameda, Calif. • Port Arthur, Texas • Chicago, Ill. • New Orleans, La. • Sharon, Pa. • Camden, N. J.

**Sales Representatives:** Great Western Chemical Co., Portland, Ore. • Seattle, Wash. • Tyler-Dawson Supply Co., Tulsa, Okla. • J. A. Bauer, Cincinnati, Ohio. • Matteson-Van Wey, Inc., Detroit, Mich. • Midway Can Co., St. Paul, Minn. • Wm. B. Tabler Co., Louisville, Ky. • F. H. Ross & Co., Charlotte, N. C. • R. B. Huber, Boston, Mass.

**United States Steel Products**  
Division of  
**United States Steel**



## EXPANSION

**Sulfuric:** Dixon Chemical & Research, Inc., and American Sulphur & Refining Co. are teaming to build a 500-tons/day, \$3.5-million sulfuric acid plant on American Sulphur's property at Sulphurdale, Utah. Operating the new unit will be a jointly owned firm to be called Dixon-Western Chemicals Inc., with offices in Bloomfield, N.J. and Beverly Hills, Calif.

**Pharmaceuticals:** Cutter Laboratories is building a 40,000-sq. ft. addition to its plant in Chattanooga, Tenn., to meet long-term demands. Plant Manager E. T. Gregory says present facilities are adequate, though new capacity will eventually be needed.

**Resins:** Reichhold Chemicals, Inc., has purchased a 70-acre tract at Newark, O., as the site for its 18th domestic plant. The new unit will produce "a full line of resins and chemicals."

**Glass:** Libbey-Owens-Ford Glass Co. (Toledo, O.) has purchased an 874-acre tract 10 miles south of Stockton, Calif., which will probably be the site for a large glass-making plant.

Reportedly, the plant will cost about \$150 million, including three \$30-million manufacturing machines; it may also develop a captive natural gas supply.

LOF insists, however, that it has no immediate plans for this new acreage.

**Cellulose Pulp:** Despite a recent hitch in financing, Alaska Lumber & Pulp Co.'s high-alpha-cellulose pulp mill at Sitka, Alaska, is nearing completion and is expected to be onstream by November. Reportedly the mill will process 340 tons/day of pulp. Two contract logging concerns are cutting timber for the mill, but the company plans to have its own forest operation later on. The parent company—Alaska Pulp Co.—is working out new financing arrangements.

## COMPANIES

**American Cyanamid** won't build its new headquarters building at Alpine, N.J. According to Cyanamid President W. G. Malcolm, the change in plans stems from objections filed by Alpine residents to rezoning the area.

**Armour & Co.** has purchased Mississippi River Fuel Corp.'s ammonia plant near Festus, Mo., for an undisclosed amount of cash. Armour will take over the plant about June 30, will expand capacity. Current output is 240 tons/day.

**Thiokol Chemical** has awarded a contract to Wallace Engineering & Construction Co. (Bryn Mawr, Pa.) to

build a new \$320,000 headquarters in Bristol, Pa. Construction work is slated for completion this November.

**Great American Industries** (New York) has acquired National Chlorophyll and Chemical Co., with plants at Lamar, Colo. National, which produces chlorophyll, carotene and other vegetable extracts, will be operated as a wholly owned subsidiary.

**Reichhold Chemicals'** new 400,000-share issue was snapped up on the same day offered last week at \$30.25/share. Closing price was 30%, up 3%.

Most of the proceeds will be used for Reichhold's '58-'60 construction program, expected to total about \$24 million.

**Thompson Ramo Wooldridge** has purchased a controlling interest in Magna Products, Inc. (Santa Fe Springs, Calif.). Magna produces specialty chemicals and electronic instruments, recently started research work on solid rocket propellents. Details of the transaction were not revealed.

**American Marietta** directors have okayed a five-for-four split of the common stock, to be distributed as a stock dividend Aug. 1. Directors also voted to continue a 25¢ quarterly dividend on the increased shares.

## FOREIGN

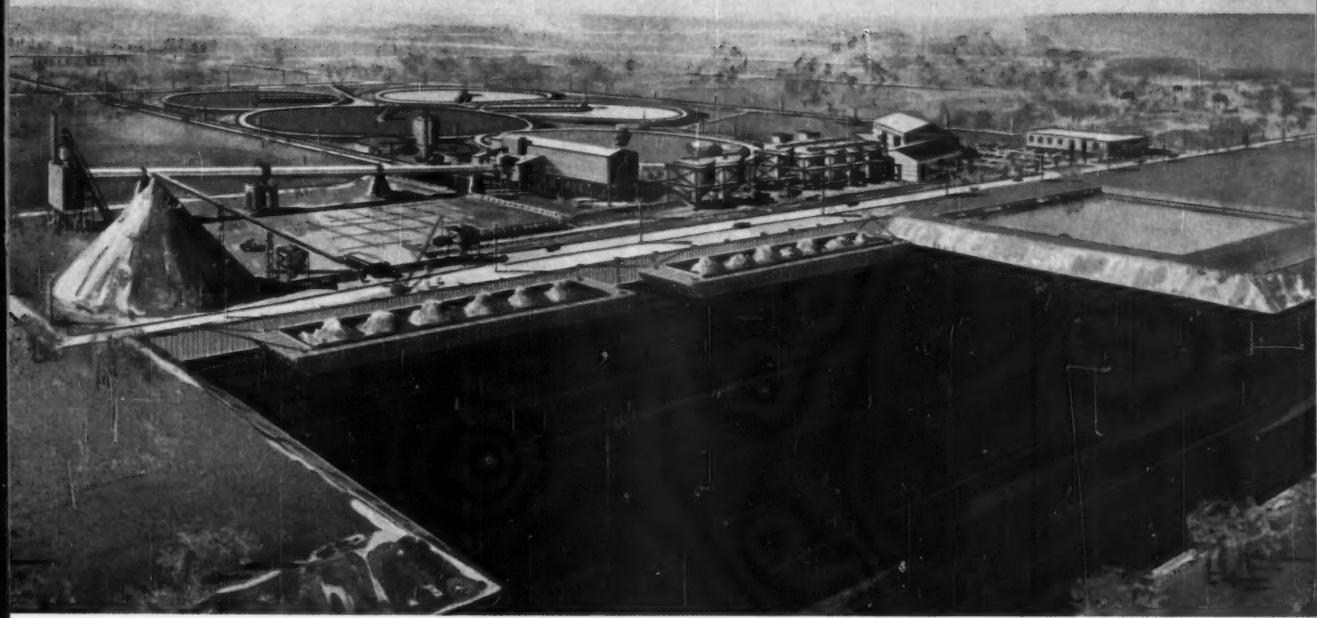
**Cosmetics/Middle East:** The Arab League's office for the economic boycott of Israel is blacklisting Revlon cosmetics, charging that the firm has set up a plant in Israel.

If Revlon fails to refute this charge, its products will be banned from all Arab League member-states. The ban would apply to all branches, subsidiaries and affiliates of the U.S. firm.

**Tires/Iran:** B. F. Goodrich Iran, S.A., newly organized subsidiary of B. F. Goodrich Co., will build a tire and tube plant on a 40-acre tract in Teheran, Iran. Completion is scheduled for early '61.

**Investment/France:** Finance Minister Antoine Pinay has set up a bureau to assist any foreign group with money to invest in the franc zone. Pinay's action stems directly from his recent visit to the U.S., where he discussed the idea with Washington officials.

**Ammonia/Mexico:** Petroleos Mexicanos will build an anhydrous ammonia plant at Nogales, Sonora. Chemical Construction (New York) has the construction contract, is granting Pemex \$7 million in credit to finance the project. Foreign materials purchases will account for \$6 million; the rest will go for Mexican labor and materials.



## Expanding company chooses Cunningham-Limp again

*New Florida plant  
of Michigan Chemical to extract  
magnesium oxide  
from sea water*

When Michigan Chemical Corporation chose Cunningham-Limp to cooperate in the designing and engineering of its new sea water magnesium oxide plant at Port St. Joe, Florida, it was another repeat order. Subsequently Michigan Chemical assigned to us the responsibility of purchasing and installing all the equipment and constructing all the necessary facilities for the production of high-purity MgO.

Repeat customers provide Cunningham-Limp with 90 per cent of its business. We're proud of that fact, of course, but we think it has even more significance than might at first be

apparent. Designing, engineering and building of superior industrial facilities are Cunningham-Limp's primary functions—but you may find that the additional services you receive from C/L are what bring you back to us again and again.

Perhaps you don't need a new plant. An engineering-economic analysis of your entire operation by our engineering staff could reveal that a modest modernization program would make a big difference in your over-all efficiency. Or a study of your plant layout, including the materials handling system, may indicate that a rearrangement of your production facilities would be to your competitive advantage. One big advantage of these studies is this—Cunningham-Limp engineers approach your work with an objective, impartial view-

point which is difficult for anyone close to an immediate problem to achieve.

Specialists in these and many other phases are available to you from our staff. If you are in doubt as to just how to improve plant efficiency most economically, a plant analysis will provide the answers. Or it may be that, like Michigan Chemical, your need is for entirely new facilities. In either case, Cunningham-Limp's varied experience is at your service—and it is enthusiastic service.

*Executives of manufacturing, distributing, research and other industries who are thinking of expansion or modernization and want to know how to approach the problem, will receive a 78-page, color-illustrated brochure covering the subject if they request it on their letterhead or business card.*

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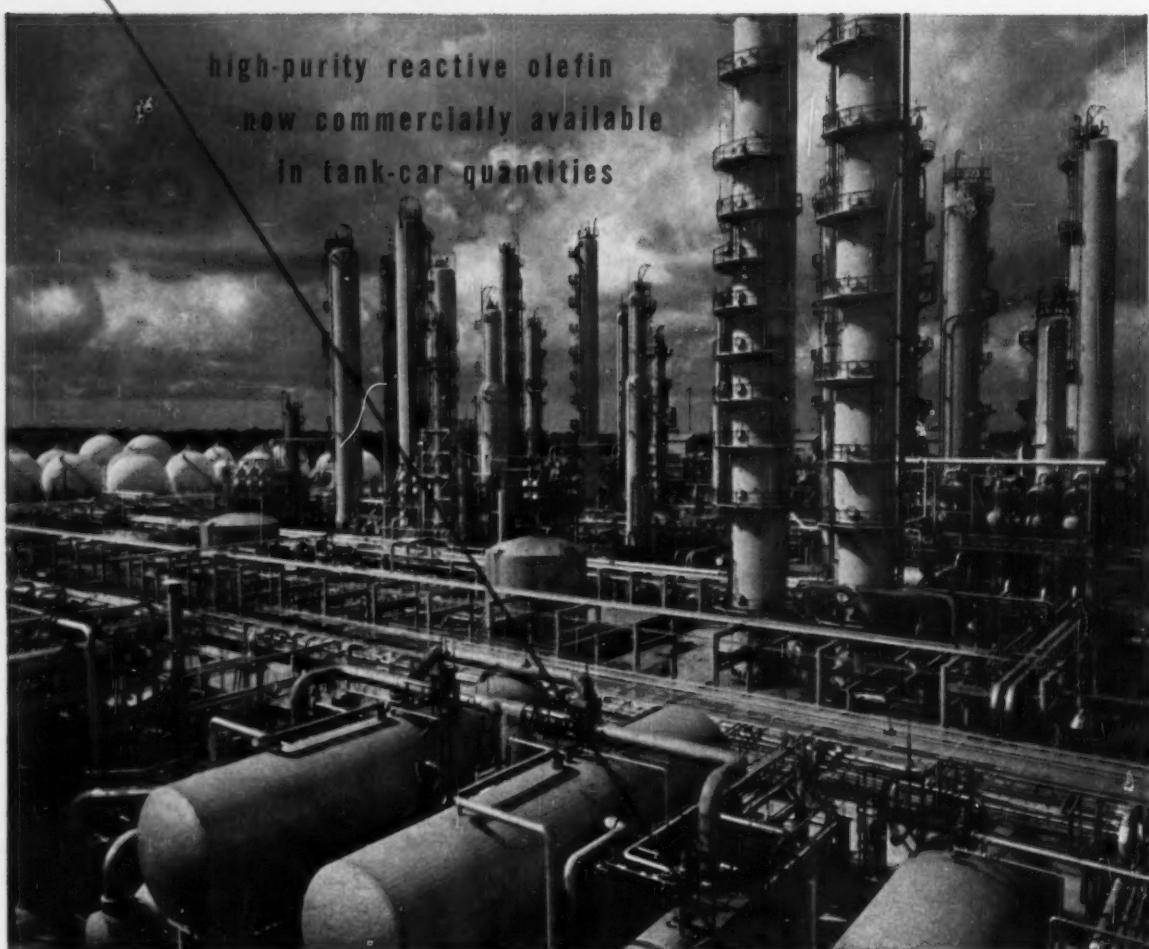
Whenever reference is made to designing, engineering or architecture, the work will be done by Cunningham Engineers, Inc., or by personnel who are qualified under all applicable laws.



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# Washington Newsletter

CHEMICAL WEEK  
June 27, 1959

**CPI firms comprise 25 of the 100 top defense contractors** listed in the Pentagon's latest roster (covering calendar 1958).

Some of the defense business of the CPI firms, of course, is in nonchemical fields. Goodyear, for instance, produces missile and aircraft hardware. But other top contractors not primarily identified as CPI producers—like North American Aviation and Merritt-Chapman & Scott—rank high in munitions business, partly because of chemical products.

Here's how the top CPI defense contractors rank:

Standard Oil of New Jersey, \$194.6 million worth of prime contracts in calendar '58, No. 22 in the over-all listing; General Tire, \$178.8 million, No. 23; Standard Oil of California, \$132.2 million, No. 26; Goodyear, \$102.6 million, No. 30; The Texas Co., \$99.7 million, No. 33; Thiokol, \$81.7 million, No. 39; Socony Mobil Oil, \$78.6 million, No. 40; Shell, \$78.5 million, No. 41; Cities Service, \$67 million, No. 48; Olin Mathieson, \$63.8 million, No. 50.

**Site for the first U.S. sea-water conversion demonstration plant** on the Gulf Coast will be one of these seven possibilities being investigated this week by the site selecting board: Key West, Fla.; Gulfport, Miss.; Rockport, Freeport, Corpus Christi, Port Isabel, or Brownsville, Tex.

Secy. of the Interior Fred Seaton will o.k. the location the board finds best suited. The plant, using a long-tube-vertical distillation process, will cost \$1.5 million to \$2 million and will produce a million gallons of fresh water daily at an estimated cost of \$1/1,000 gal.

Both Texas and Florida are considering putting some money toward the project. A possible factor favoring Texas this time: if Key West is passed over, it might possibly qualify for a later plant as an East Coast site.

**Design of the Quartermaster Corps' high-intensity food irradiator** is being completed in Washington. Spokesmen for the Atomic Energy Commission, which is handling the project, still expect construction of the project to be completed at Stockton, Calif., by the summer of '60. The pilot plant will contain 2 million curies of cobalt-60, and will be used for preservation of food. Funds for construction already have been voted by Congress.

AEC's top authority on radioisotopes, meanwhile, says tracer methods of testing the toxicity of food additives should be a boon to smaller food manufacturers. Such manufacturers, says Paul Aebersold of the Office of Isotopes Development, would otherwise find it difficult to afford tests now required by the federal government. He points out that radioactive

## Washington Newsletter

(Continued)

tracers markedly reduce testing time, are more accurate and can "contribute to a significant reduction in costs."

**Efforts to ban import of Soviet science teaching equipment** are meeting solid opposition from the Administration, although the two chief proponents are influential Republican senators, Bridges (New Hampshire) and Keating (New York).

The two senators are trying to tack an amendment onto an appropriation bill due for floor consideration soon. It would block local schools from spending federal grant money to buy Soviet equipment for their labs. The Administration calls this unwarranted federal interference in local school business, and notes there are other ways to stop imports if domestic industry is really threatened.

The senators assert that the equipment is deliberately underpriced to hurt U.S. manufacturers and score a propaganda victory with impressionable school children. An equipment importer says, however, that it was entirely his initiative, not the Russians', that started the flow of equipment into this country.

**Opposition to federal interference in air-pollution problems** was expressed before a House Commerce Subcommittee by the Manufacturing Chemists' Assn.

The Public Health Service wants authority to conduct investigations and hold hearings on the spot. But MCA wants the federal role limited to research, training of engineers and scientists, and technical services to local government. Air pollution, MCA contends, is a local problem that varies considerably from one community to another.

A handbook on water-pollution laws and practices in various states is now available from MCA (1825 Connecticut Ave., N. W., Washington). Price: \$5.

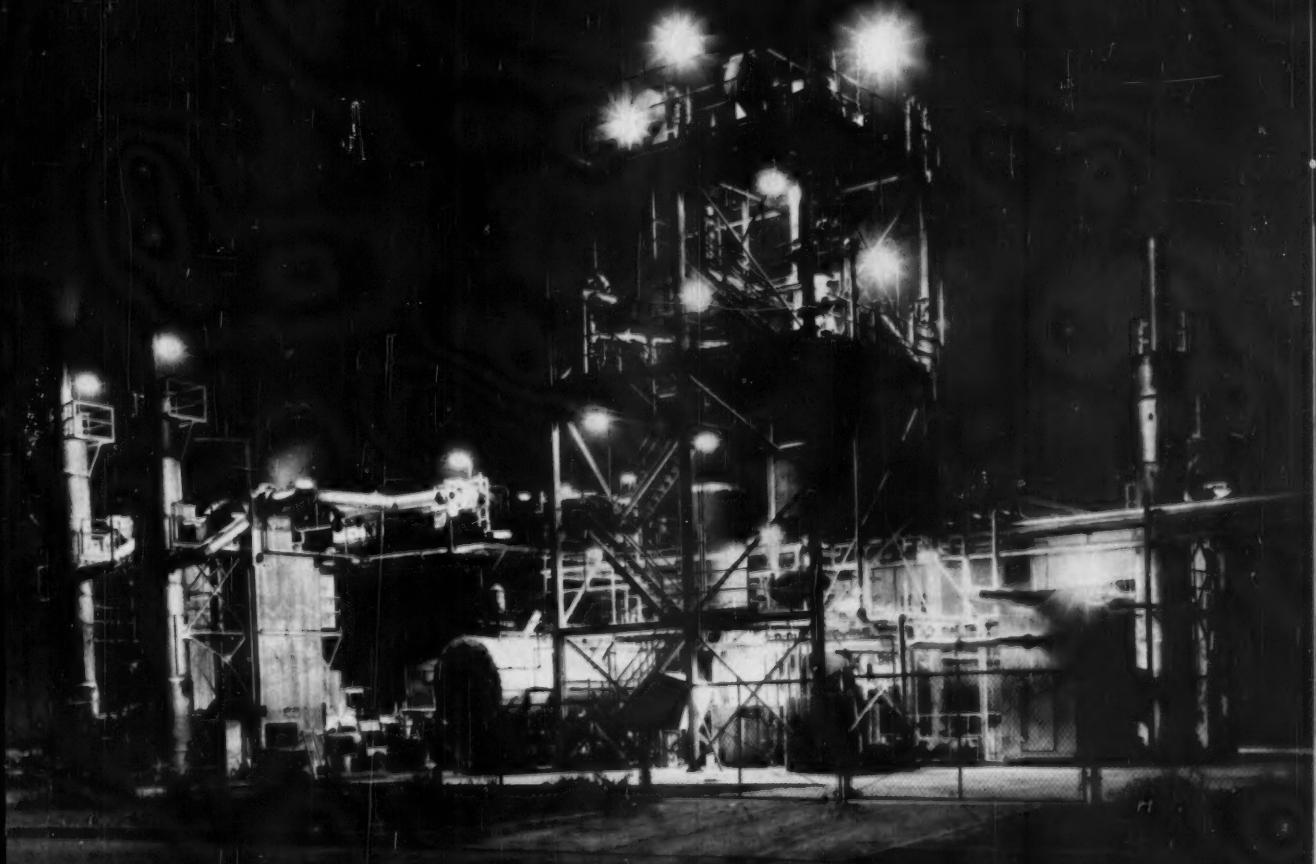
**A study of the long-range outlook for energy resources** in the U.S. will be undertaken by a special subcommittee of the Joint Congressional Economic Committee.

It will look into the prospective requirements, cost and development of conventional sources (coal, oil, gas, waterpower) as well as possible new sources, such as atomic energy. The problem is whether expected power output can keep up with improving technology and automation. The chairman is Rep. Wright Patman (D., Tex.).

**More research into effects of pesticides on fish and wildlife** was advocated last week by the Interior Dept. The department went before Congress to ask for an enlarged research budget. Its claim: investigations reveal the research problem to be larger than anticipated when the existing authorization was drafted.

BASIC CHEMICALS  
RESINS • EMULSIONS  
PLASTICS • COLORS  
ADHESIVES  
PLASTICIZERS

# CHEMICAL PRODUCTS FOR INDUSTRY FROM REICHHOLD



# INDUSTRIAL CHEMICALS

**FORMALDEHYDE** — An important raw material in the manufacture of resins, adhesives, textiles, leather, rubber and numerous other products. It is marketed by RCI in five different concentrations.

**GLYCERINE** — Used in the manufacture of synthetic resins, pharmaceuticals, cosmetics, food products and as a humectant.

**HYDROCHLORIC ACID** — Has wide application in the chemical industry for pickling and cleaning metals, processing textiles, refining ores and in the manufacture of chemicals generally.

**MALEIC ANHYDRIDE** — Principally used in the manufacture of synthetic resins, synthetic drying oils, and related products. Its highly reactive structure lends itself to the synthesis of complex organic chemicals by the Diels-Alder process.

**METHANOL** — A widely used solvent and chemical intermediate for the manufacture of formaldehyde, rocket fuels, amines and esters.

**ORTHO-PHENYLPHENOL** — A very effective fungicide and bactericide used in many industrial applications for outstanding preservation.

**PENTACHLOROPHENOL** — Used in various fungicides, bactericides, algicides and herbicides; in agriculture, lumber, pulp and paper applications.

**SODIUM PENTACHLOROPHENATE** — The water soluble salt of penta used to prevent microbiological attack on many organic substances such as wood, adhesives, protein materials.

**PENTAERYTHRITOL** — Used primarily in the manufacture of alkyd resins. Imparts better film properties such as high gloss retention, good durability, faster drying. Used also in ester gums and synthetic drying aids.

**PHENOL** — A building block in the plastics industry. Also widely used in the intermediates required for the production of synthetic detergents, lubricating oil additives, insecticides, bactericides and pharmaceuticals.

**PHTHALIC ANHYDRIDE** — Used extensively in the manufacture of alkyd and polyester resins, plasticizers, organic pigments and dyestuffs, and pharmaceuticals, as well as other fine chemical intermediates.

**SEBACIC ACID** — Sebacic acid esters are finding increased usage as plasticizers for PVC systems and in low temperature aircraft lubricants.

**SODIUM SULFITE** — Primarily used by the paper industry in the manufacture of kraft paper and fiber board by the semi-chemical hard wood process.

**SULFURIC ACID** — A basic commodity used in the paper, dye and pigment, textile, fertilizer and organic chemical industries.

# SURFACE COATING MATERIALS

## RESINS

**BECKOSOL** — Alkyd resins: phenolated, phthalic-free, rosin modified, drying oil and non-drying oil types — for a wide variety of surface coating requirements.

**SUPER-BECKOSOL** — Isophthalic acid alkyds . . . widely used as vehicles for premium surface coatings.

**SUPER-BECKAMINE** — Melamine-formaldehyde resins for automotive finishes and appliance enamels.

**WALKYD** — Drying oil alkyd resins for flat wall vehicles (including thixotropic types and vehicles specially developed for use with odorless solvents).

**BECKAMINE** — Thermosetting urea-formaldehyde resins for use in giving special properties to alkyd vehicles.

**SUPER-BECKACITE** — Pure phenolic resins, both oil reactive and non-reactive types, for finishes with exceptional durability.

**BECKACITE** — Maleic, fumaric and modified phenolic resins offered in a wide range of prices to meet any cost problem in varnish vehicle and ink manufacturing.

**POLYLITE** — Polyester resins specifically developed for metal, wood, and masonry coatings with outstanding properties.

**EPOTUF** — A complete line of epoxy resins and hardeners especially suited to production of corrosion resistant metal coatings. Choose either liquid resins or resin solids in solution. Esters available, too.

**STYRESOL** — Styrenated alkyd resins.

**PENTACITE** — Pentaerythritol resins.

**BECKOPOL** — High melt point modified phenolic resins.

**LUSTRASOL** — Acrylic and acrylic-modified alkyd solutions.

**WATEREZ** — Alkali-dispersible modified alkyd resins.

## EMULSIONS

**WALLPOL** — Homopolymer and copolymer polyvinyl acetate emulsions for wall sealers, flat wall coatings, spackling compounds, and exterior stucco and masonry paints that are easy to formulate, easy to use.

**SYNTHEMUL** — Acrylic emulsions for the manufacture of aqueous architectural and industrial finishes, floor polishes and paper coatings . . . alkyd emulsions for water-thinned architectural and industrial finishes with properties approximating those of solvent-thinned enamels.

## INORGANIC CHEMICAL PIGMENT COLORS

### IRON BLUES

### CHROME YELLOWS

### CHROME GREENS

### ZINC YELLOWS

### MOLYBDATE ORANGES

## PLASTIC MATERIALS

**POLYLITE** — Polyester resins for press molding, laminating, casting, structural layup, impregnating, encapsulating, rigid polyurethane foam production, surface coating, corrugated and flat sheet production and matched die molding.

**PLYOPHEN** — Liquid and powdered phenolic resins for every major application including brake linings, battery separators, resinoid grinding wheels, wood waste molding, decorative laminate core stock, casting, hot and cold punching stock, gear stock, rolled tubing, insulation bonding, plastic faced plywood and surface coating.

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**FABREZ** — urea-formaldehyde resins.

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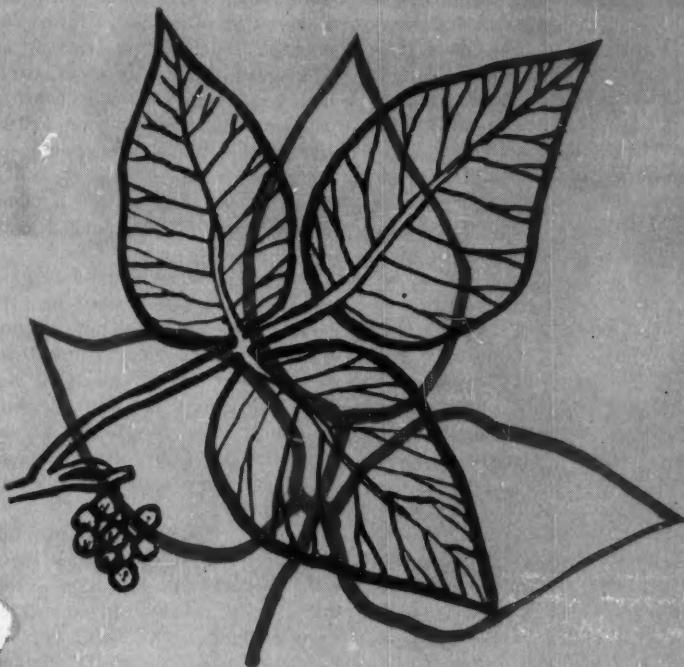
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# SPECIALTIES

## Five keys to the poison ivy remedy market



1—The skin irritant of poison ivy, poison oak and poison sumac is the same, a phenolic substance called urushiol (3-penta-decyl-catechol).

2—Approximately 50% of all young white adults are sensitive to the poison ivy antigen. Few over 60 remain susceptible.

3—All states have at least one form of these dermatitis-causing plants.

4—Urushiol irritation of skin is a true allergic hypersensitivity reaction, can occur only if the skin makes direct contact with the oily sap.

5—The four varieties of ivy cause over 1 million cases of poisoning each year in the U.S.

## Poison Ivy Tab Tops \$10 Million/Year

Contact with poison ivy, poison oak or poison sumac causes over a million cases of itchy skin each year in the U.S., has its suffering victims spending an average of about \$10 million/year for medication to alleviate their misery. A variety of new anti-ivy products may help build the market still more.

Among them:

- Rowell Laboratories (Baudette, Minn.) recently came out with Residerm, a product that works by an ion-exchange process. The exchange resin and the ivy phenol form an inactive, nonirritating resin phenolate, which is washed off the skin with water. The product is currently sold as a lotion, in two sizes—a 2-oz. (\$1.49) and a 6-oz. (\$2.75) container. There's a patent pending.

- In the prophylaxis approach to the allergy, considerable refinement has been made in administration of poison ivy extract. Syntex Chemical Co. (New York) has been doing well,

according to the company, with its Aqua Ivy, an oral tablet that, at the end of six weeks' administration, is supposed to give immunity to poison ivy for a year. This oral extract was originally offered by Strong Cobb & Co., Inc. (Cleveland). Syntex obtained the patents about two years ago, now has the exclusive right to use it. Aqua Ivy is sold in 100-tablet jars (\$4.95). Said to be on the way—a point not confirmed by the company—is a liquid form of Aqua Ivy.

**Oral Liquids:** Cutter Laboratories Inc. (San Francisco) is already offering an oral liquid form of poison ivy extract. A drop of the product in a glass of water may be taken each day until immunity is built up. Broemmel Pharmaceutical Co. (Los Angeles) also has a liquid extract. Both products are sold over the counter.

The oral tablet and oral liquid forms of poison ivy extract have, in many cases, replaced the administra-

tion of poison ivy extract by injection. Currently the most widely used injection treatment is that developed around '45 by Margaret B. Strauss of New York University. She replaced the oil (or alcohol) type of injection with an alum-precipitated pyridine ivy extract in an aqueous medium. This permitted the extract to be administered with a smaller needle (cutting down pain) and also enabled physicians to administer larger doses of the antigen because of slower absorption rates.

Among companies offering injectable forms of ivy extract are Wyeth Laboratories, division of American Home Products (Philadelphia); Merck Sharp & Dohme, division of Merck & Co. (Philadelphia); Cutter Laboratories and Broemmel Pharmaceutical.

Even though the orally administered extracts undoubtedly have more customer appeal, many companies feel that oral products create too many

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side effects. Apparently most firms will stick with the injectable forms.

**Nonspecific:** A fairly recent item is E. R. Squibb & Sons' (division of Olin Mathieson Chemical Corp., New York) ethical drug, tradenamed Kenalog. Chemically it's 9-a-fluoro-16-a-17-a-isopropylidene-dioxy-Δ-1-hydrocortisone. Though not pushed specifically as a poison ivy treatment, the product is said to show marked anti-inflammatory, antipruritic and anti-allergic effects against poison ivy allergy. Squibb's synthetic corticoid has been incorporated in a cream, in a lotion and in an ointment—all to be applied to the affected area two to three times daily.

**Stand-bys:** In a spot check of the industry CW found that a surprising number of products were being recommended as treatments for ivy poisoning. Here's what some of the drugmakers are offering:

Chas. Pfizer & Co. (New York) has four steroids for treatment of poison ivy and poison oak. Cortril ointment and Magnacort ointments contain hydrocortisone. Neo-Magnacort and Terra-Cortril ointments also contain antibiotics in addition to hydrocortisone to guard against bacteria infection that frequently complicates ivy poisoning. Terra-Cortril contains Terramycin; Neo-Magnacort, neomycin sulfate. All are ethicals. All sell in ½-oz. and ½-oz. tubes.

Upjohn Co. (Kalamazoo, Mich.), like Pfizer, is pushing steroid compounds for poison ivy treatment. Upjohn's products in this field are Medrol (methyl-prednisolone), Solu-Medrol and Oxyline.

**Look Alikes:** A number of companies are paying royalties to Titanium Alloy Manufacturing Division, National Lead Co. (Niagara Falls, N.Y.), for the topical application of zirconium compounds. Among the companies that Titanium Alloy now has under license are Parke, Davis & Co. (Detroit); Lederle Laboratories, division of American Cyanamid Co. (Pearl River, N.Y.); and McKesson & Robbins Inc. (Bridgeport, Conn.).

Although Titanium Alloy has had the patent on the zirconium-containing compounds since before '51, products incorporating them have been sold extensively only since '56. Mechanism of the metal-salts' relief: the zirconium in them combines with the

hydroxy groups of urushiol (the toxic factor in poison ivy plants), to render the irritant inactive.

Parke, Davis markets Ziradryl (an antihistaminic, plus zirconium oxide) in both cream and lotion form. Lederle has Rhulispray (an aerosol) and Rhulicream. Besides zirconium oxide, both Lederle products contain benzocaine, menthol and camphor. Lederle also offers Rhulitol for poison ivy treatment. Rhulitol doesn't contain zirconium oxide, is instead a tannic acid in a solution containing phenol, chlorobutanol and camphor.

Bristol Laboratories and Ciba Pharmaceutical Co. (New York) offer zirconium oxide-containing products, too—Bristol's Zirnox, Ciba's Antivy. Like most of the other products of this type, both Zirnox and Antivy contain an antihistamine in addition to zirconium oxide. All of these zirconium-containing compounds are sold over the counter.

To get an idea of the kind of products being offered by private labelers, CW checked with Rexall, was told that it was currently pushing three items under its own label. Newest is Rexall Aerosol Poison Ivy Lotion, which contains zirconium carbonate as the active principle. The material emerges as a foam, is used prophylactically to prevent incurrence or therapeutically to prevent spread. A 6-oz. can costs \$1.69. Histacalma Lotion (6-oz. can, 96¢) incorporates phenyltoloxamine dihydrogen citrate as antihistamine, plus benzocaine and calamine lotion. Histacalma Creme is the same as the lotion except that the antihistamine is phenylpyramine.

**Aerosols Up:** Aerosols undoubtedly will get more play in this field in the near future. There are a number of products now on the market and others will be along soon.

Although many first-aid books still recommend washing of the skin with laundry soap after contacting poison ivy, and the treatment of the dermatitis with calamine lotion, these treatments appear to be giving way to more sophisticated—expensive—treatments. Drugmakers are figuring that prophylaxis is almost certain to become more popular as a result of the public's acquaintance with the Salk vaccine and the oriental flu vaccines—both prophylaxis treatments. And, gradually, the first-aid books are beginning to drop calamine as a recom-

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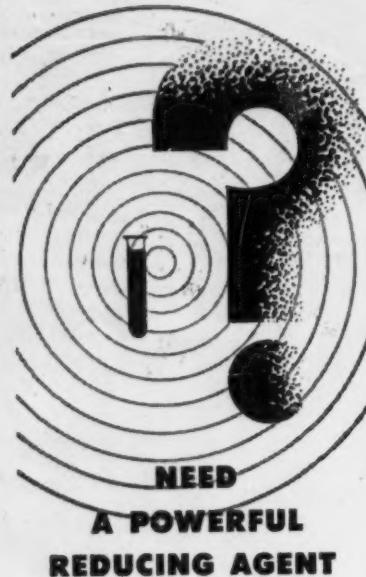
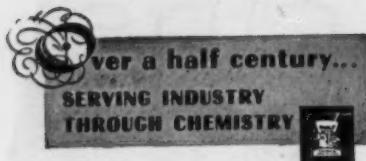
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#### SPECIALTIES

mended treatment. There's a current feeling that applying a phenolated compound on top of the *Rhus* antigen actually harms, rather than helps, the ivy-poisoned patient.

The more expensive treatments coupled with changing U.S. habits that increase exposure to the plants (more travel, increased numbers of suburban dwellers) and the general increase in population should mean bigger sales of poison ivy remedies.

#### PRODUCTS

**New Herbicide:** Geigy Agricultural Chemicals Division of Geigy Chemical Corp. (Ardsley, N.Y.), is now selling a triazine herbicide, Prometone 25E (methoxy propazine). It is reportedly promising for control of Johnson grass and Bermuda grass among others.

**Shoe Polish Polymer:** Polyvinyl Chemicals (Peabody, Mass.) has developed a series of emulsion polymers for shoe polishes and dressings. The products, called NeoCryl Series W63, are said to give excellent gloss and leveling and good compatibility with waxes, resins, dyes and pigments.

**Fights Asthma:** A combination tablet, Manax, for control of bronchial asthma and related allergic conditions has been introduced by J. B. Roerig and Co., division of Chas. Pfizer & Co. (Brooklyn, N.Y.) It is a combination of Atarax (hydroxyzine hydrochloride) and ephedrine sulfate and theophylline.

**New Hair-Spray Resin:** National Starch and Chemical Corp. (New York) has entered a new resin copolymer, Resyn 78-3010, in the aerosol hair spray resins market.

According to National, sprays with varying permanency can be produced simply by varying the water solubility of the resins—supplied as a dry, water-insoluble powder, the resin is neutralized to the desired degree by the formulator with AMPD (2-amino-2 methyl-1, 3 propanediol). The material is completely odorless, can be readily perfumed, according to National. Resyn 78-3010 is currently selling for about 75¢/lb.

**Granular Flocculant:** A flocculating agent in granular form has been de-

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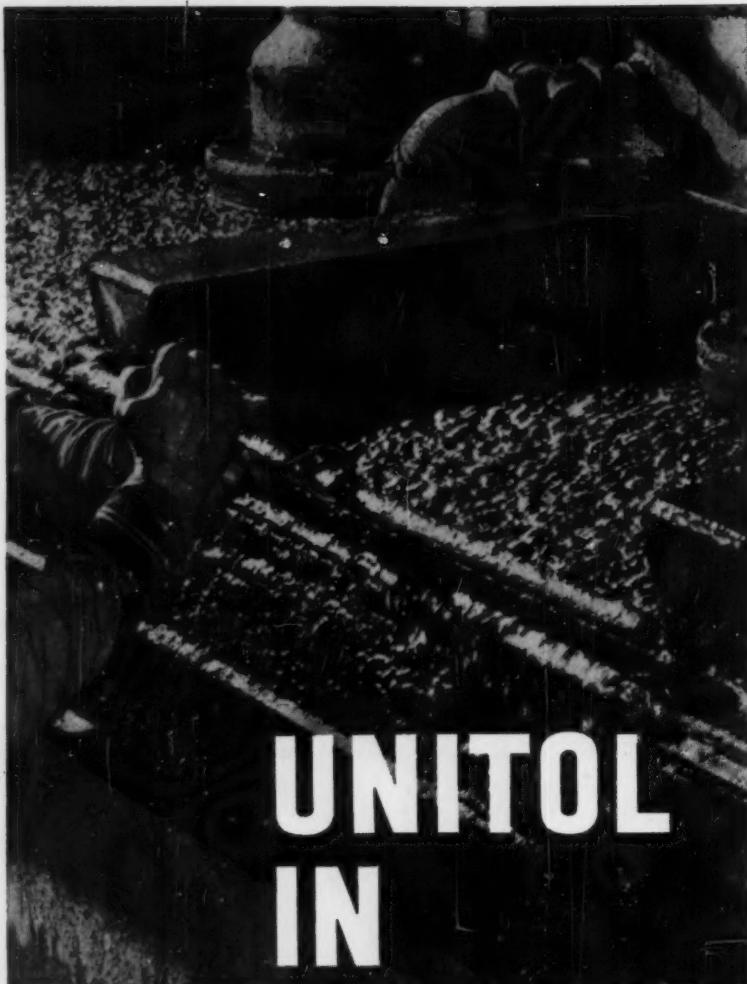
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## SPECIALTIES

veloped by American Cyanamid Co. (New York) for solid-liquid separations. The product, called Superfloc 16, is said to be particularly effective in thickening operations for increasing settling rates and overflow clarity. In settling acid-leached uranium ore at a Canadian countercurrent decantation plant, it was found that 0.06-0.07 lbs. of Superfloc 16 provided the same settling rate as 0.11 lbs. of the previously used product.

**Finer Foam:** Continental Oil Co. (Houston, Tex.) has gone into commercial production of Conoco Demivis, a synthetic calcium sulfonate in a plasticized system for use in making open-cell vinyl foam. The product is suggested for open-cell foam when density of 5 to 7 lbs./cu. ft. is desired; densities up to 10 lbs./cu. ft. are possible. Product is said to produce uniform cell structure in vinyl foams.

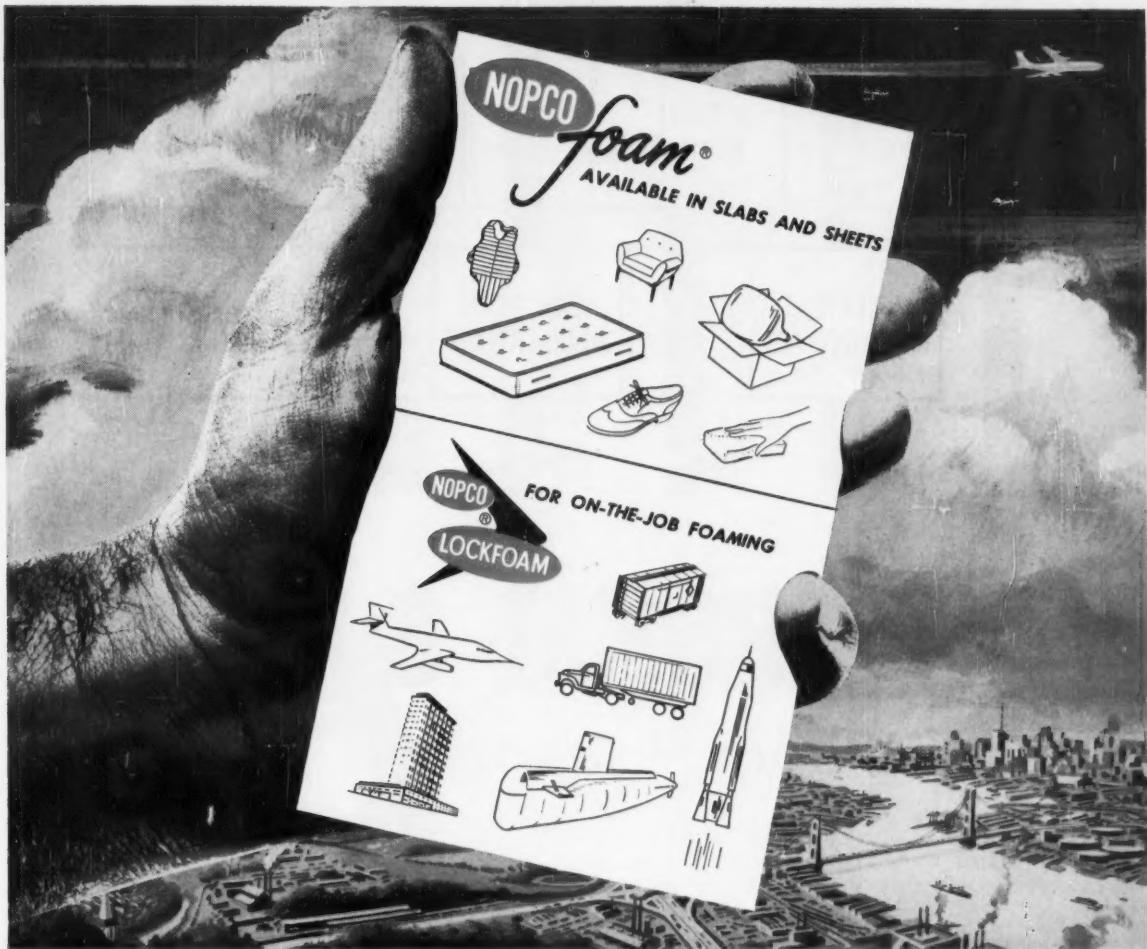
## PATENTS

**Paperhanger's Special:** Dow Chemical Co. is assignee of U.S. patents 2,885,306-307. The patents describe "a sheet of paper bearing a normally solid and visually homogenous coating, nontacky at room temperature and capable of being activated by heat to a tacky and adhesive state, which persists for several minutes after cooling to room temperature." The essential constituents are a styrene-butadiene polymer mixed with discrete particles of 1,2-bis (2-phenyloxy) ethane (patent 2,885,306) or 1,2-bis(4 tert-butyl 2-chlorophenoxy) ethane (patent 2,885,307).

Delayed tack adhesives of this type were looked at with great interest in the early '50s by makers of wallpaper, and the recent Dow patents indicate that interest in the adhesives has not died out.

**More Time for Taste:** General Foods Corp. has been awarded a series of 10 patents (U.S. 2,886,440 through 2,886,449) covering a variety of methods of drying and otherwise preparing gelatin as a chewing gum flavor carrier. Methods of drying by spray tunnel, foam, freezing and drum are included. Apparent object of the General Foods work: to produce chewing gum with a more permanent flavor.

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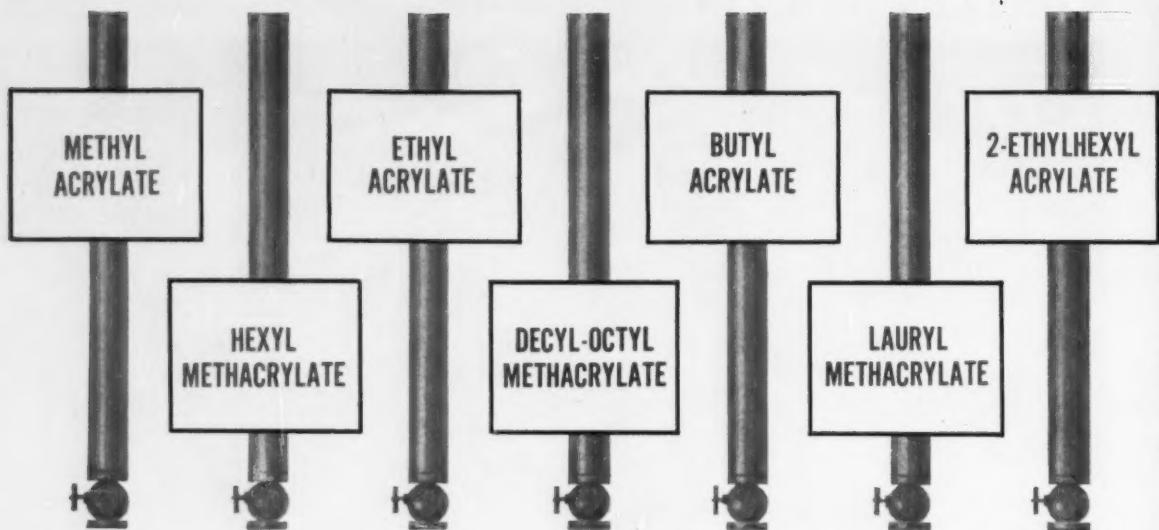
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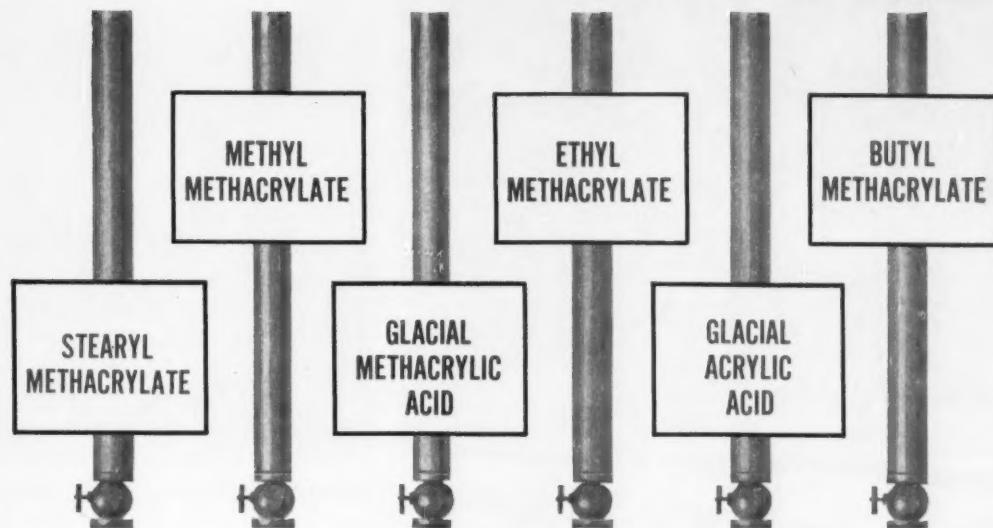
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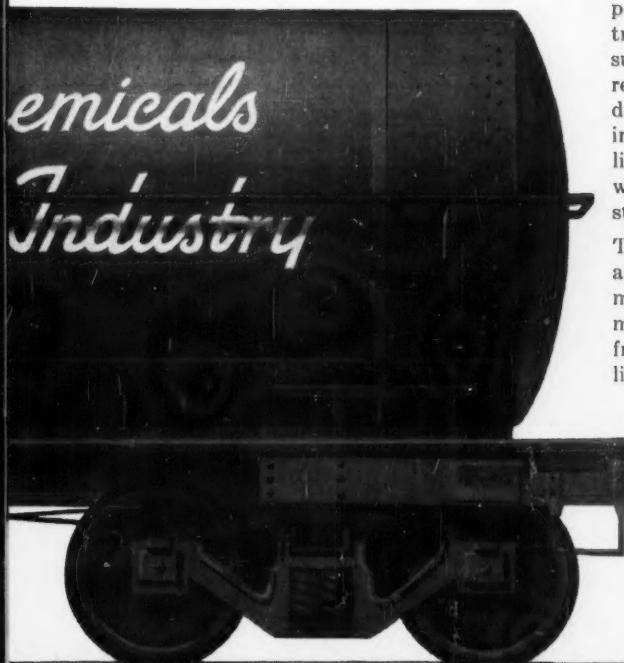


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For Dony Stoy, wife of a Texas Gulf Sulphur plant manager, buying pineapples in a Mexican marketplace is an everyday opportunity to build good industrial relations. Her contribution: willingness and ability to fit her living patterns to the traditions of a Mexican village.

Mrs. Stoy, whose husband Robert manages TG's sulfur mining operations at Nopalapa, near Coatzacoalcos, is representative of growing numbers of CPI management family members learning to put their best foot forward far from familiar American Main Streets, and whose companies are learning what needs they must fill to entice such personnel into foreign scenes.

**Sulfur Activities:** Five or six years ago, the Isthmus area in Mexico was practically uninterrupted jungle, ex-

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SWIMMING at Panam lake is diversion.



TG GUEST HOUSE is where visitors and employees beat isolation.

## Learn Goodwill Is Key to Good Business

cept for some small but important ocean and river ports at Coatzacoalcos and Minatitlan. The only big operation in that part of the world was Pemex, Mexico's national oil company.

Now there's a beehive of activity between jungle sulfur mines and the port towns. American sulfur companies have set up shop, bringing with them such items as water-skiing on reservoir lakes, air-conditioned houses, and guest hotels for a stream of company visitors from the States.

Although the problem of setting up independent little communities for engineers and their families is mostly over now, other problems arise of a more subtle nature. These pose such questions as how to keep wives and families happy in isolation where social life is nil, how to get along with local Mexicans who often resent American

intrusion, how to educate children where more advanced schooling seldom exists.

Texas Gulf, for example, has its main offices in the town of Coatzacoalcos, a boom town many believe some day could become another Houston. Besides TG, which has its main office in an unpretentious colonial-style building with high ceilings and rotating ceiling fans, the other sulfur companies all have dock and shipping facilities there. All these, plus others due to move in, make for a growing professional class and more social life for the previously isolated area.

Robert Stoy and his wife have been in Mexico for six years and speak good Spanish. Dony, who does all the marketing herself, plays cards with local Mexican ladies and runs the

TG guest house over the downtown offices, which has rooms for eight people. TG, because it is a direct offshoot of a big American company, keeps its doings quiet, doesn't even have a sign marking the office front. The men and their wives, four American and four Mexican families, live wherever they can get a house. The men, for the most part, commute every day by plane or helicopter between the town and Nopalapa.

Many families enjoy extracurricular hobbies. The area is loaded with archeological wealth, which provides interesting exploration.

On the drive into camp from TG's small airstrip near the canal connecting the works with the nearby river, there's abundant wildlife. And over at Gulf Sulphur's camp, only 15 minutes away from the TG camp by motor

widen social spheres, improve contacts.



CHILDREN'S SCHOOLING is by American teacher, correspondence courses.

our cue  
to you—  
**INTERMEDIATES**  
OF  
**HIGHEST PURITY**  
AND  
**UNIFORMITY**  
FOR  
**QUALITY**  
**PRODUCTS**

WE LIST THE FOLLOWING AS EXAMPLES  
OF OUR EXTENSIVE PRODUCT RANGE.

AMIDOL (2,4 DIAMINOPHENOL HCl)  
(photographic developing agent)  
VEROL  
ORTHO-AMINOPHENOL  
PARA-AMINOPHENOL  
(fur-dyeing)  
ORTHOCHLORANILINE  
(insecticides, fungicides and dye-stuffs)  
CHLORANISIDINE  
PARA-CHLOR-ORTHO-NITRANILINE  
META DIAMINOANISOLE BASE  
META DIAMINOANISOLE SULFATE  
2.5 DICHLORANILINE  
2.5 DICHLORNITROBENZENE  
META DINITROANISOLE  
ETHYL PARA TOLUENE SULFONATE  
METHYL PARA TOLUENE SULFONATE  
(the harmless methylating and ethylating agents  
for application as latent acids)  
HYDROQUINONE  
photographic grade  
ORTHO-NITROPHENOL  
(crude)  
PARA-NITROPHENOL  
PARA-PHENYLENEDIAMINE DISTILLED LUMPS  
(and other phenylenediamine isomers)  
ACETOACET-ORTHO-CHLORANILIDE  
PARA-AMINOBENZOYL J ACID  
(6-(p-amino benzamide)-  
1-naphthol-3-sulfonic acid)  
2-AMINO-4-NITRO-6-CHLOROPHENOL  
4-AMINO-2-NITROPHENOL  
7-ANILINO-1-NAPHTHOL-3-SULFONIC ACID  
(phenyl gamma acid)  
6 ANILINO-1-NAPHTHOL-3-SULFONIC ACID  
(phenyl gamma acid)

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naphthols, phenols and anthraquinones.

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Dyestuffs, Organic and Aromatic Chemicals  
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BRANCHES: MAYFIELD, PENN. • PROVIDENCE, R.I. • ROCK HILL, S.C.  
plus the well-known specialty products of  
BAYER LEVERKUSEN • CASSELLA MAINKUR

ADMINISTRATION

**'Good Neighbor' Role Pays Off in Goodwill**



Bus service is provided by company for workers, mostly rural, at Panam site.

boat, several of the technicians collect and study wildlife.

Jack Brooke is Gulf Sulphur's chief at the mine site, near a little village called Salinas, about two hours boat ride from Coatzacoalcos. Brooke is an example of the cognizance by American firms of the value of personnel who can speak the local language and know the local people.

Brooke and his wife, Lucy, have lived in Mexico most of their adult lives. Both speak Spanish without any "gringo" accent and are accepted almost as Mexicans by the locals. They have been invited to employee activities, including a wedding where both were able to fit into the ceremonial atmosphere with the result that they established a very friendly feeling between themselves and the local people.

Among other things, Gulf Sulphur has contributed to local good feeling by putting in a potable-water system—the same water as the Americans in camp drink—and has also given heavily to the local school.

In talking about what companies should do in Mexico to further good relations with local people, Brooke says, "You can't just run around doing good . . . we are not social workers and, actually, the local people resent it. You can find out what they really need; then make the idea seem to stem from one of them. You can offer to donate some of the materials, as we did for the water system, and then let them build it."

Brooke and the other sulfur man-



Rebuilt railway was Panam project.

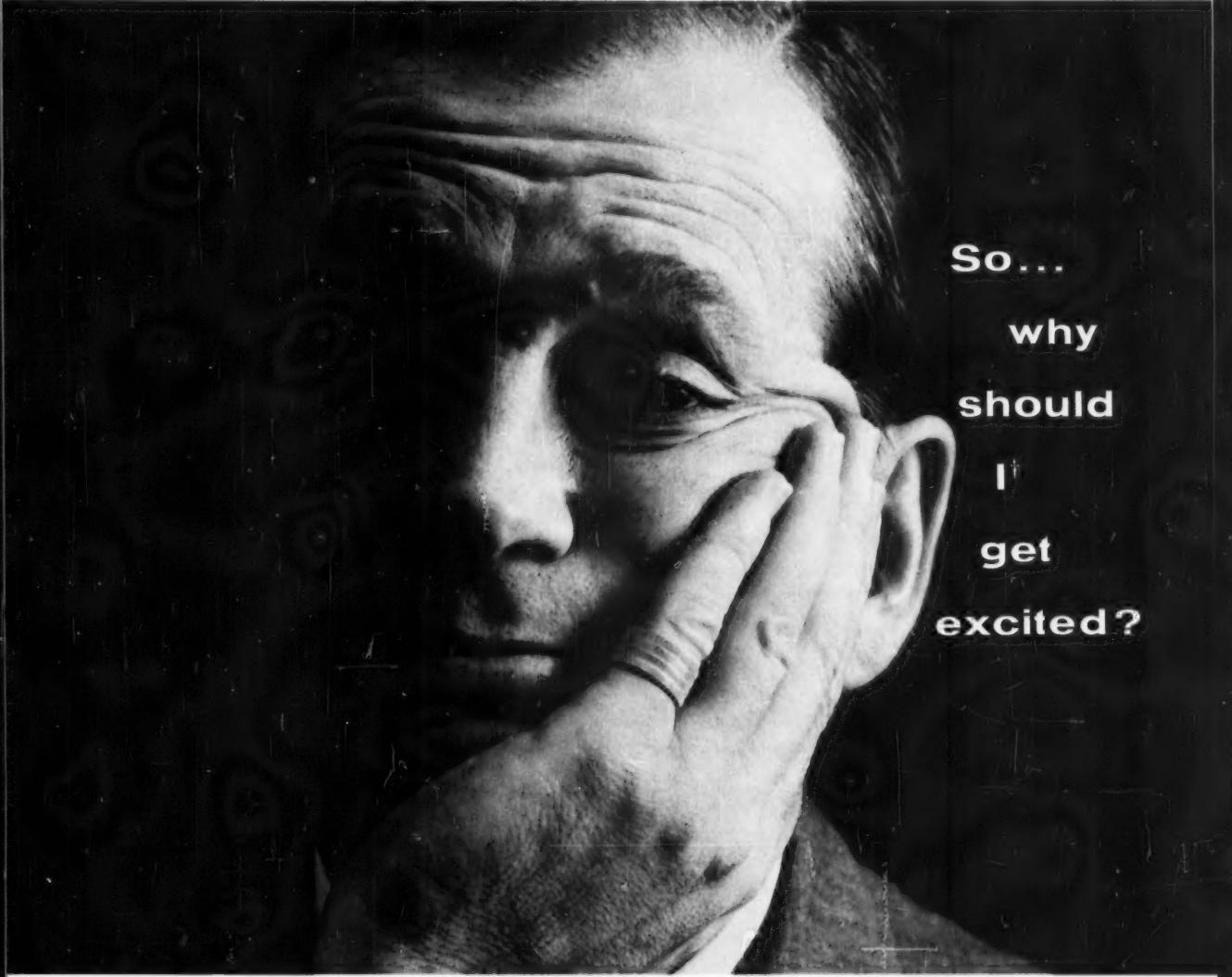


Village water system was Gulf gift.

Monsanto  
announces

# LYTRON\* 822

## Resin!



So...  
why  
should  
I  
get  
excited?

\*LYTRON: Reg. U. S. Pat. Off.

†Compounder of floor polishes, clear and pigmented protective coatings, inks,  
adhesives, electrical component coatings, cosmetics, or toiletries.

what  
is  
**Lytron 822  
Resin?**

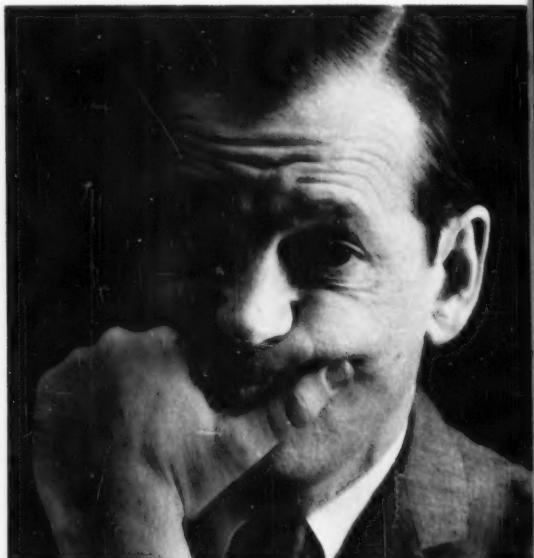


A polyelectrolyte resin, free-flowing, powdered carboxyl containing styrene copolymer.

PHYSICAL CONSTANTS		SOLUBILITY	
Total Solids:	100%	<b>Soluble in:</b>	ammonia
Specific Gravity:	1.14-1.16	ethyl acetate	xylol/butanol
Dielectric Constant:	3.29	acetone	
Dissipation Factor:	0.02991 } at 1 mc	methyl ethyl ketone	<b>Insoluble in:</b>
Acid Number:	approx. 190	II-B alcohol	hexane
Equivalent Weight:	approx. 295	alkalies	toluene
Stability of Solid Resin:	No change on storage under normal conditions.		

good  
for  
what?

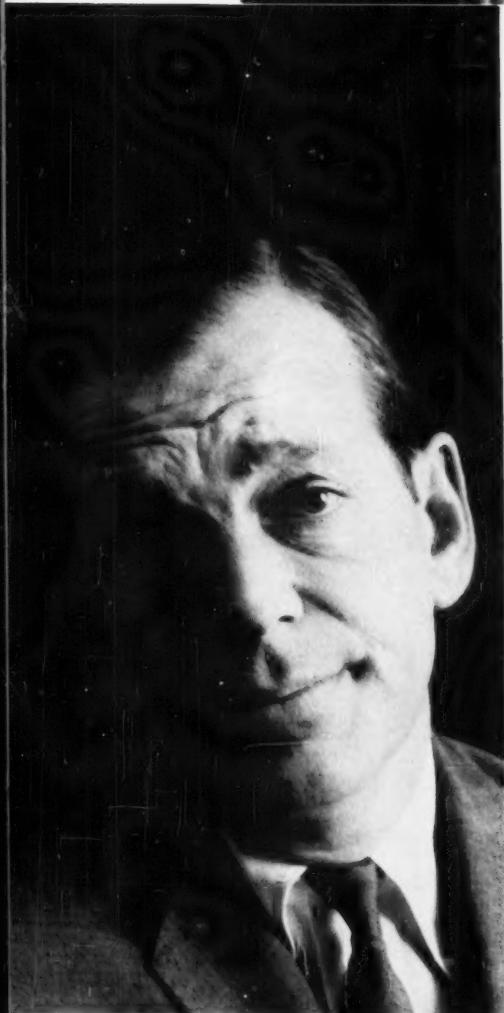
Lytron 822 Resin is recommended for use as a protective colloid, film forming vehicle, dispersing agent, pigment binder, emulsifier. It can also be a reactive component in water and organic soluble thermosetting coatings. Excellent in combination with starch and dextrin for adhesives.





## what's so special?

Ease of solution in alkaline or organic solvent systems. Relatively low molecular weight qualifies Lytron 822 for applications heretofore restricted by the high solution viscosities characteristic of this type compound. Compatibility with a wide range of natural and synthetic resins. Clear continuous films cast from both alkaline or organic solutions of Lytron 822 resins. Every product will have good color and color retention.



### words... words... words...

Take compatibility. In the unneutralized acid form, Lytron 822 resins are compatible with polyvinyl butyral and many alcohol soluble resins. Partial compatibility (low concentrations) is achieved with nitrocellulose. Compatible with ammoniacal solutions of Lytron 822 resins: rosin derivatives, (hydrogenated rosin) unsaturated oil acids, polyhydroxy compounds and their water soluble derivatives (methoxy polyglycols, polyglycols, polyglycol mono-ethers) urea and melamine resins.

Partial compatibility results when these materials are added to ammoniacal solutions of Lytron 822 resins: polystyrene, styrene-butadiene, copolymers, polyvinyl acetate, acrylic, waxes, starch, casein, and soya protein.

**Note: LYTRON 822** has exhibited considerable promise as the alkali soluble resin in self polishing resin emulsion and wax emulsion floor dressings. LYTRON 822 is easy to compound, compatible with currently favored constituents in floor polishes and contributes to the stability and good color of the emulsion. When used with other constituents like polystyrene latex and polyethylene wax, the formulator can prepare a polish based entirely on uniform synthetic materials. These polishes perform as well as polishes based on natural resins—but with improved color and stability of supply and price of the raw materials.



O.K.  
Send  
me  
a  
sample.

**Monsanto Chemical Company**  
**Plastics Division**  
**Springfield 2, Mass.**

Please send me sample, Technical Bulletin,  
and price schedule on Lytron 822 Resin.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

We'll also be glad to send samples, technical bulletins and price schedules to anyone else listening. Use coupon or write Monsanto Chemical Company, Plastics Division, Room 900, Springfield 2, Mass.

## ADMINISTRATION

agers in the area agree that the best local civic projects for the companies are those that enlist plenty of local cooperation in the work. Panamerican Sulphur Co., perhaps the biggest setup there, for example, donated the money and some of the materials for the civic center; but the local contractors are building it themselves, the way they want, with local labor. All firms have built houses for local help.

**Help for Ladies:** Women from all the camps visit the U.S. several times a year, and the ladies at Gulf Sulphur's camp go into town once a week on the "ladies' boat." The ride down the river is intriguing, with Indian dug-out canoes passing by.

"I actually like it here most of the time," says Brooke's wife. She has an air-conditioned house with large rooms and a beautiful kitchen, all furnished by the company. She has servants, and she loves to garden and make shopping trips into the nearby coastal towns.

At the Panamerican operation, there's much to contrast with the ancient Indian and colonial setting. Panam has a model village of ranch-style brick and tile residences surrounding a lake whose water flows to both a reservoir and a settling area for the sulfur processes.

Richard Mills, vice-president and director of Panam's operations, has five years on the job in the Isthmus, has picked up Spanish and a knowledge of local thinking that has proved a big asset. One of the biggest drawbacks to a successful operation abroad, says Mills, is language. Management finds it hard to communicate with workers, and wives find it difficult to mix with the population. This cuts the effective sphere of all, leading to boredom and tension.

Mills has organized language classes both for Americans and their wives and for the Mexican technical personnel and their wives.

**Adds Up:** All this adds up to future benefits, management in Mexico feels. Many think that the Mexican government has its eye on the American sulfur companies. Just how well the companies and other U.S. chemical companies will fare in future negotiations with the government depends a lot, they think, on how well they fit into the local surroundings and how well their local managers can become "Mexicanized."

## Synthetic Resins Suit

**American Cyanamid Co.'s** legal battle with Ellis-Foster Co. (Montclair, N.J.) over manufacture of a type of ethylenic synthetic resins has entered a new phase that points up the problem of interpreting old agreements in the light of new developments. Latest maneuver: Ellis-Foster has brought suit in U.S. district court (New York) charging that Cyanamid infringed the Montclair firm's U.S. patent 2,225,313, called "Ethylenic-Alpha-Beta Synthetic Resins." The patent expired last year.

The New York action was, in effect, a countersuit filed in response to a suit entered last April in U.S. district court (Newark, N.J.) by Cyanamid. The actions, however, are independent and separate, legally speaking.

In the Newark court, Cyanamid seeks an injunction against Ellis-Foster, blocking the firm from "interfering with Cyanamid's customers' sales of polyester resin products in Germany," claims that Cyanamid was licensed by Ellis-Foster to manufacture and sell the synthetic resins under the firm's German patent 967,265.

Basic in both suits is the question of the interpretation of a royalty-free, nonexclusive licensing agreement between Cyanamid and Ellis-Foster. Cyanamid claims that the agreement—signed in '36, before the U.S. patent issued—also included the process covered in U.S. patent 2,255,313. Ellis-Foster says the agreement did not include the process.

## LABOR

**Paper Agreement:** Kimberly-Clark Corp. and Local 12970, District 50, United Mine Workers, have concluded a one-year pact providing an 8¢/hour wage increase. The contract runs through June 8, '60, also provides for liberalization of pay for time not worked.

**Squibb By-product:** A by-product of the recently settled strike by E. R. Squibb operating employees (*CW Business Newsletter*, June 20) has been a drive to organize office and professional employees. Though spokesman for the company would not comment on the situation, union organizers at Local 13-438, Oil Chemical & Atomic workers, at New Brunswick, N.J.,

# Pyrroles

Have we told you about two newly available materials in the field of synthetic nitrogen chemistry? They're Pyrrole and N-Methyl Pyrrole. Both are highly reactive and have application in organic synthesis. We could set down here some physical characteristics, but instead we invite you to write for our latest technical bulletins. In them, we point out such salient facts as molecular weight, solubility, boiling point and many other interesting data designed to help you determine whether you may have applications. If you desire, we'll send sample quantities, too—no charge, of course. Should one of these chemicals seem to meet your needs, we'd be delighted to get together to discuss possibilities and problems.



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FIRE FIGHTING EQUIPMENT  
INDUSTRIAL CHEMICALS

ANSUL CHEMICAL COMPANY • MARINETTE, WISCONSIN

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The giant new Copper Smelter of Kennecott Copper Corporation, Hayden, Arizona; designed, engineered and built by WKE.



### THE WKE RECORD OF PLANT SAVINGS

The WKE approach to design, engineering and construction makes the difference in economy of plant investment. It's reflected in the fact that many WKE-built plants have been completed below original cost estimates—even at remote job sites. The men of WKE can assist you in projecting requirements in men, materials, equipment, processes and scheduling by evaluations and studies; a method of accurate appraisal and planning that means more plant per dollar spent!



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### ADMINISTRATION

report some response to a distribution of application blanks. Asked to comment on how soon an election petition might be made, organizers said the "response is not that good yet." At New York union offices, spokesmen for Local 14-138 reported a "good verbal response."

**Carbon Strike:** In Morgantown, W. Va., Circuit Court Judge Hugh B. Campbell has reaffirmed a restraining order limiting picketing at the Great Lakes Carbon Co. plant, on strike since April 30. About 400 union members of Local 427, International Chemical Workers Union, struck over what the union terms a program to increase worker output.

Great Lakes has hired nonunion personnel, is operating with them and supervisory workers. There has been one rock-throwing incident at the plant; union officials have said they feared violence similar to that at Henderson, N. C., where a textile firm hired nonunion workers to run its plant.

### KEY CHANGES

**Charles H. Sommer** to executive vice-president, director and member of the executive committee; **Robert M. Morris**, to vice-president and general manager of the Organic Chemicals Division.

**Fred Powell** to president and chief executive officer, **W. H. Shiffler** to vice-president, California Chemical Co.; **M. E. Wierenga** to vice-president, director and marketing manager, California-Spray Chemical Corp.

**Carleton B. Edwards** to board chairman, **Peter C. Reilly** to president, Republic Creosoting Co. and its subsidiary, Reilly Tar and Chemical Corp.

**James P. Farrell** and **J. Steele Brown** to vice-presidents, General Chemical Division, Allied Chemical Corp. (New York).

### DIED

**James H. Hibben**, 62, chief of the chemical division, U.S. Tariff Commission, at Washington, D.C. Fellow of the American Institute of Chemists and other societies; member of numerous professional groups; author of "The Raman Effect and Its Chemical Application."

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n. Butyl Acetate • Methyl Amyl Acetate  
"Cellosolve"® Acetate • Isobutyl Acetate  
Primary Amyl Acetate  
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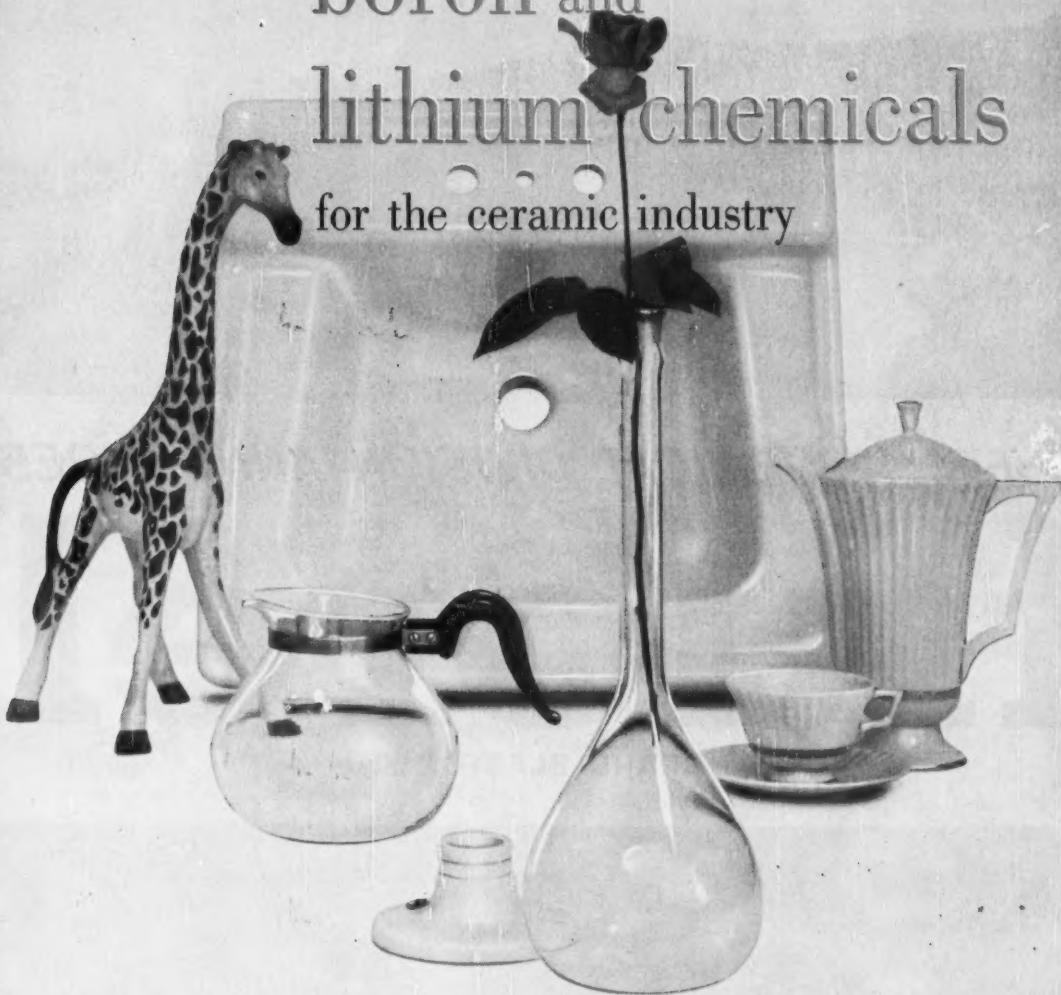
\* Reg. Trade Mark

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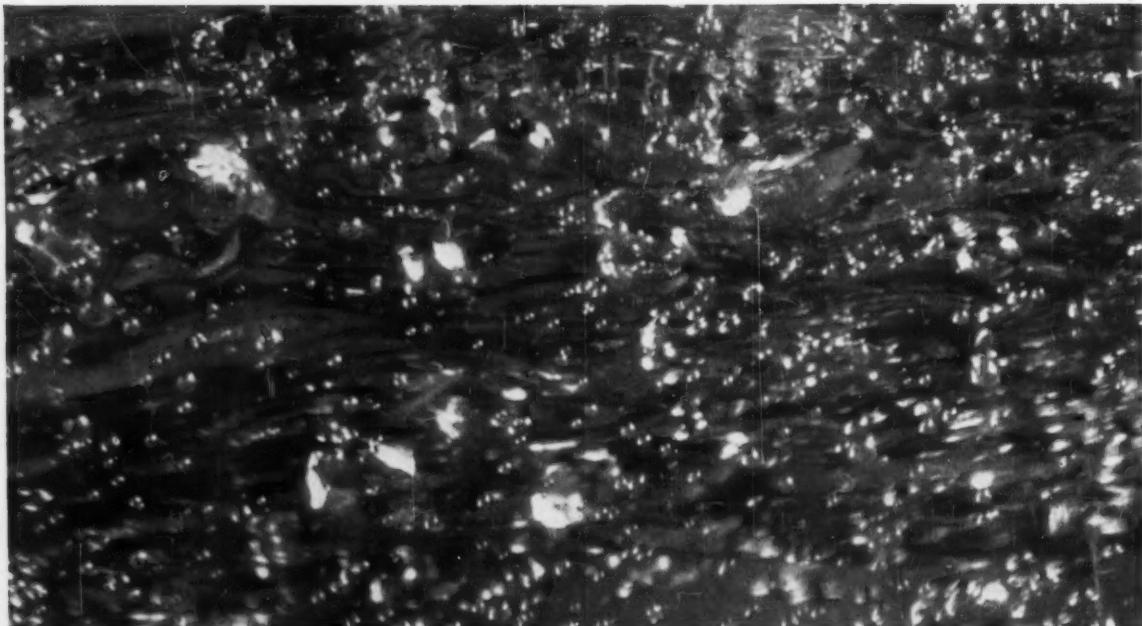
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*THE 3M CHEMICAL DIVISION ANNOUNCES*

# **fluorel<sup>\*</sup>**

BRAND ELASTOMER





CHEMICALS

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*New fluorinated synthetic rubber offers top performance in contact with oils, fuels, solvents, acids at temperatures over 400°F. and under some service conditions at temperatures up to 600°F. And it's particularly easy to process and mold.*

Even at extreme temperatures, FLUOREL Elastomer maintains excellent resistance to compression set. Approaching 600°F, elongation and hardness do undergo a slight change. Yet, no matter how hot it gets, FLUOREL Elastomer will never support combustion.

On the other end of the temperature scale, at -50°F. thin sections may be bent.

As well as being highly resistant to corrosive fumes and many fluids even when they're blistering hot, FLUOREL Elastomer shows no change after one year's exposure in a heavy industrial atmosphere. Ozone resistance? No cracking after 200 hours' exposure at 150 ppm by the bent loop method.

FLUOREL Elastomer exhibits electrical properties comparable to those of electrical grade vinyl chloride polymers. That's indicative of good performance, but specific data is yours for the asking.

To complete the property picture: FLUOREL Elastomer is moderately resistant to gamma radiation emitted by Cobalt 60.

**EASY TO PROCESS**—Besides being easy to process on conventional equipment, FLUOREL

Elastomer is easy to compression mold and extrude, and it can be bonded to most metals with adhesives.

No doubt about it! FLUOREL Elastomer is an important newcomer to the ever-expanding family of 3M organic fluorine compounds. It's the direct result of the same pioneering know-how and research that have made 3M a leader in the chemical industry. Following the tradition of its many predecessors, FLUOREL Elastomer should greatly extend the performance range of applications requiring elastomeric materials.

**APPLICATIONS**—FLUOREL Elastomer is now either in use or under evaluation in the missiles and aircraft, automotive and chemical processing industries for oil seals, "O" rings and gaskets. Tests and field reports are encouraging and suggest other applications as yet untried, such as fire walls, air ducts, fuel cells, fuel and hydraulic hose, diaphragms and tank linings.

For complete data, at our expense, write: 3M, Chemical Division, Dept. KAK-69, St. Paul 6, Minnesota.

\*The term FLUOREL is a trademark of Minnesota Mining and Manufacturing Company.

CHEMICAL DIVISION

**MINNESOTA MINING AND MANUFACTURING COMPANY**

... WHERE RESEARCH IS THE KEY TO TOMORROW



# NEW PRODUCTS...NEW PLANT



## VITEL\* and VIDENE\* by GOODYEAR PLANT by CATALYTIC

Vitel, a new polyester resin, and Videne, a new polyester laminating film, are now in commercial production at the Goodyear Point Pleasant Chemical Plant at Apple Grove, West Virginia.

Engineering, procurement and construction were the unit responsibility of Catalytic. Coordination and cooperation with the client were a necessity to complete this unique installation "On Time—On Budget."

The production of Vitel and Videne by Goodyear paves the way for many new applications in the textile, metal, wood, paper, packaging and related industries.

Thinking of new plants for new products? Consult CATALYTIC first.

\*Vitel, Videne—T.Ms., The Goodyear Tire & Rubber Company, Akron, Ohio

**Catalytic On-Time . . . On-Budget Service**  
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# CATALYTIC

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Ontario; Montreal, Quebec.

# PRODUCTION



**Squatting in tank, D&A worker checks improved agitator.**

## Readyng a 'Next Time' Plant

After the man above hoisted himself out of the tank in which he's pictured, he gave an o.k. on the installation of the tank's newly designed agitators. It's one of several improvements that Dewey & Almy Chemical Division of W. R. Grace & Co. has put in its new resin and battery-separator plant at Owensboro, Ky., started up last week.

All based on the company's experience with making the same products in successful plants in Cambridge and Acton, Mass., the new features are the realization of engineers' classic wish, "If we could just build from scratch

next time, we'd know how to do it better." Included in D&A's real-life "next time" plant: an extra-large ventilating system designed so that all open air intakes are upwind (regardless of wind direction); improved instrumentation that allows an unusual amount of automation for a batch process; separate cooling tanks for polyvinyl acetate; a waste disposal system that dumps into the Ohio River cleaned-up water that's purer than the river itself; improved and versatile product storage and shipping facilities; several other experimental ideas.

**Improvement Planning:** Spurring the

design of this improved plant was the rapidly expanding line of resins produced by D&A. The number of PVAc products alone has approximately tripled since the Acton plant was built in '51. Designed with this basic need in mind, the new plant has its organic lines (one each for butadiene-styrene and PVAc) in a straight-line arrangement, with individual pieces of equipment capable of handling any formulation in the respective line.

A scale model of the plant has been of great value from the start (see p. 89). During the design stage a small, simple model was built to help everyone agree on the general layout. After the design was frozen, a larger model that included piping was built, used through the construction stage. And its usefulness continued—it was part of a four-week course for training operators.

**Production Control:** A number of changes were aimed at improving reaction control and efficiency in the butadiene-styrene latex line. Purpose of the new agitator is two-fold: to improve heat transfer of the highly exothermic reaction, and to move the material faster when it is at peak viscosity. The agitator finally decided upon was the result of experiments carried out in the company's two-year-old, \$750,000 pilot laboratory at Cambridge. In addition to supplying the desired mixing characteristics at high viscosity, the new design—consisting of optimum shapes and positions of impellers and baffles—was found to boost heat transfer by 35%. Use of larger reaction vessels and improved instrumentation were also vital to temperature control.

Having PVAc cooling vessels saves time for the reaction vessels, allows them to process more monomer in a given period of time because they are not tied up in the cooling operation. Conceivably, these coolers could be converted to reactors, but the plant has been designed to meet growing needs for at least two or three more years.

**For Customer and Community:** Product and waste handling are also handled in a way new to D&A. To guarantee that an ample inventory of its wide range of products is always at hand, the company installed more

## PRODUCTION

and larger product storage tanks at Owensboro than at its other locations. The uniform tanks are capable of handling almost any formulation, offer facilities for a versatile inventory. A "hold" tank is also provided so that rush orders can be filtered and ready to load when the truck or tank car arrives. And, in the event of a pile-up, facilities are capable of filling three tank trucks and two tank cars simultaneously.

Disposal of organic-containing waste water is a problem that had to be met to the satisfaction of the community as well as that of the Ohio River Valley Sanitation Commission. Evaporation pits were the answer in the Massachusetts plants because of their distance from any major body of water. But Owensboro uses a coagulation pit to remove the bulk of the waste latex, follows coagulation with settling in a 1.5-million-gal. pond. The company can show that its waste water is purer than the river water.

**Fresh-Air Fans:** One of the most unusual features of the new plant is its positive-pressure ventilation system, designed by Wolverine Equipment Co. (Cambridge, Mass.) to exhaust up to 100,000 cfm. from the battery separator area.

Four large fans, one for each corner of the building, bring in fresh air. Only those intakes upwind of the plant vents, however, are used; a wind-direction indicator tells when to shut the downwind intakes. The hot air, chemical fumes and the dust (from chopping the resin-impregnated sheets) are "pushed" through hoods into scrubbers by the intake air, then vented. Inlet fans and motors are large enough to allow two or three inlets to do all necessary ventilation. According to Wolverine, this directional feature is the only installation of its kind in the industry. And intake operation could have been made automatic if desired, although manual operation helps keep operators aware of ventilation problems.

**Experimental Features:** In addition to the permanent features of the Owensboro plant, several others are being tried out. For instance, polyethylene pipe (up to 3-in.) is being used wherever possible because it is easily installed and does not contaminate D&A's products. Victaulic fittings are being tried out on Schedule 5

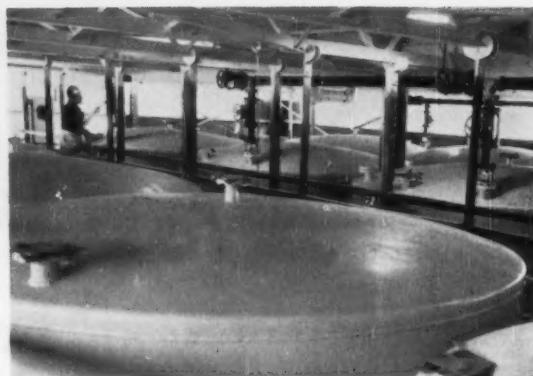
INSTRUMENTATION provides better temperature control.



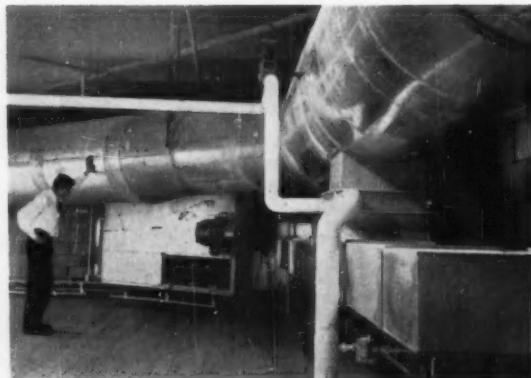
COOLING TANK for PVAc line saves time in reaction vessel.



STORAGE TANKS are lined to hold variety of products.



VENTILATION features new vent system to keep fumes out.





Symbolized here is the uncontrolled (multi-point and premature) surface ignition on hot engine deposits that results in abnormal pressure rise and engine noise in some high-compression automobile engines. Driving conditions breed a problem too. Start-and-stop driving that builds excessive deposits is prime offender.

## ATTACK ON A NEW KIND OF ENGINE KNOCK...

Celanese compounds modify engine deposits, improve combustion, reduce noise

Two great industries face a real problem in uncontrolled combustion—which results in a rumbling vibration in the higher compression engines of some today's automobiles. This new kind of engine knock not only disturbs car owners—it puts limits on compression ratios, gasoline composition, and potential engine efficiency.

Among fuel additives researched to combat abnormal combustion, only the organo-phosphorus compounds have been able to help; they modify the composition of hot engine deposits, thus control surface ignition, and reduce excessive pressure and engine "screaming."

Since the first phosphorus additives were introduced into motor fuels a few years ago, Celanese has been a leading supplier to a growing number of gasoline refiners. And indeed, phosphates—which we have been producing for 35 years—are only one member of a huge family of Celanese chemicals basic not only to the automotive and petroleum industries but to scores of others as well.

Whatever *you* produce, whatever your problem, perhaps there is some way in which we can serve you, too. Celanese Corporation of America, Chemical Division, Dept. 852-F, 180 Madison Ave., N.Y. 16.

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## PRODUCTION

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Vinyl  
Cellulosics  
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Rubbers  
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to prepare  
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Coated Fabrics  
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about other  
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specific applications.



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pipe to allow rapid disassembly for cleaning and maintenance; and Teflon-lined valve plugs are being installed. In addition, the number of different types of pumps used has been kept to a minimum to allow more interchangeability of parts.

Built with an eye to the future, D&A's new plant should be its production showpiece for some time.

## EQUIPMENT

**Reducing Regulator:** Mason-Neilan Division of Worthington Corp. (Norwood, Mass.) has added a new pilot-operated reducing regulator to its line of pressure regulators. The new regulator, called Model 201-21, is available in three pressure ranges: 2-12 psi., 8-50 psi. and 25-150 psi. It comes with  $\frac{3}{4}$ - to 2-in. screw connections or 2- to 4-in. flange connections.

**Variable-Speed Transmission:** Two new models in its Varidrive line of variable-speed transmissions and integral motors are new offerings of U.S. Electrical Motors Inc. (Box 2058 Terminal Annex, Los Angeles 54). New models 65 and 70 are rated at 30 and 60 hp., respectively.

**Radioactive Testing Equipment:** Instron Engineering Corp. (Canton, Mass.) has added two remote-control models to its line of radiation testing equipment. Models TT-C and TT-B both feature separate control panels and loading frames, facilitate testing of in-cell irradiated materials.

**Nozzle Liners.** Teflon liners for the nozzle openings of reactors, condensers, pumps and other process equipment have been added to Resistoflex Corp.'s (Roseland, N.J.) Fluoroflex-T line. They are recommended for use in heat-exchanger tubes at the tube-sheet opening and in glass- or ceramic-lined vessels for protection of nozzle openings. The liners are inert to chemicals at temperatures up to 500 F.

**Ceramic Filter:** Commercial Filters Corp. (2 Main St., Melrose, Mass.) has a new ceramic filter element, said to have high resistance to heat, heat shock and chemical attack. The fused-glass filter is primarily for microfiltration of corrosive, high-temperature liquids and gases such as 95% sulfuric

acid, 50% hydrogen peroxide and boiler water from nuclear reactors. Filters are offered with micron-size particle retention ratings between 1 and 100. Filter-tube sizes: 10 x  $2\frac{1}{2}$  in., 20 x  $2\frac{1}{2}$  in., 30 x  $2\frac{1}{2}$  in.

**Sump Pumps:** The Deming Co. (Salem, O.) and the Denver Equipment Co. (P.O. Box 5268, Denver 17) are out with new sump pumps.

• Deming's pump, called Demersible, combines pump and motor in one unit, is said to be suited to applications where high water may completely cover the pump. Capacities: 15 to 700 gpm.

• Denver's pump is designed for operation in small spaces on low horsepower. The pump can be used in acid- and abrasive-pulp service in sumps 12 ft. deep. Capacities: 20 to 1,400 gpm.

**Load-Limiting Relay:** Johnson Service Co.'s (Milwaukee 1) new V-26 load-limiting relay, for use with pneumatic-control systems, provides overload protection of motors for centrifugal compressors, fans, pumps and electrical heating systems. The relay can be adjusted for any current value between 3 and 7 amps.

**Valves:** Three new valves are now offered for a variety of service uses.

• A direct-operated reducing valve for steam and air service is available from Mason-Neilan Division of Worthington Corp. (Nahatan St., Norwood, Mass.). Model No. 17-1 is for steam service; No. 17-22, with special soft seat, for air service. Sizes:  $\frac{1}{2}$ ,  $\frac{3}{4}$  and 1 in.; pressure ranges (for steam) 2-12, 8-50 and 25-150 psi.

• A new valve for tanker and barge unloading, said to reduce problems of flange alignment during gasket insertion, is a product of Kerotest Manufacturing Co. (2525 Liberty Ave., Pittsburgh 22). The valve has one extended flange that allows extra hand-space between valve body and flange. A hose flange can be rested on lugs extending beyond the lower lip of the stationary valve flange face to align it properly. C clamps on the extended flange assure joint tightness.

• A new butterfly valve, with rubber seat, for tight shutoff in 150-psi. service is offered in 4- to 20-in. sizes by the Henry Pratt Co. (319 West Van Buren St., Chicago 7).

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Contamination by air can destroy the purity and reactivity we take such care to produce in Solvay® Anhydrous Aluminum Chloride. So, from production to packaging we protect it from atmospheric moisture. An example of this is the airtight chute (circled) used in loading the Solvay-designed truck for bulk shipments. Similar precautions are taken in filling the various sizes of steel drum packages to assure product quality and safe handling.

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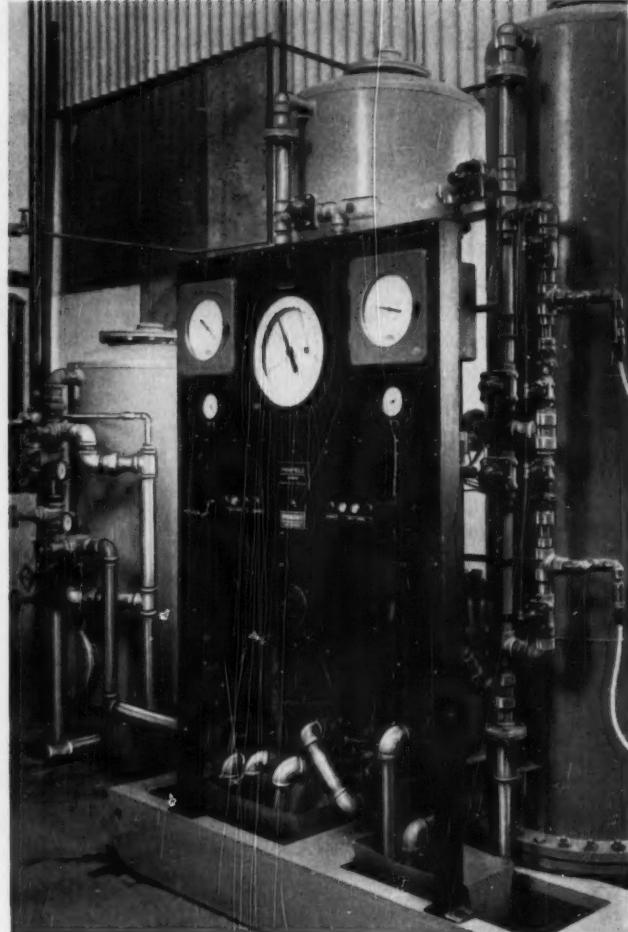
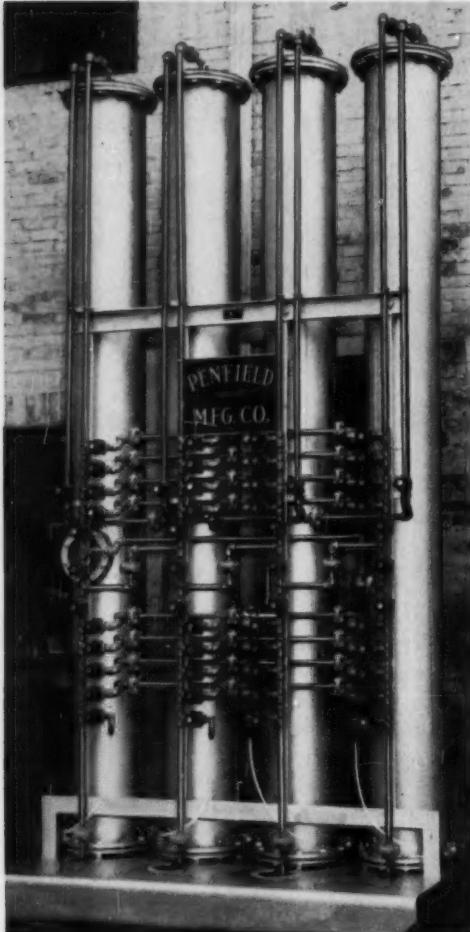
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# Technology Newsletter

CHEMICAL WEEK  
June 27, 1959

**Terephthalic acid directly from benzene** is claimed for a new process developed by Henkel & Cie., GmbH. (Duesseldorf-Holthausen, Germany). All that's now known about the new route is that it uses potassium carbonate, carbon dioxide and a heavy-metal catalyst at high temperature and pressure.

An earlier Henkel process, piloted by Hercules (*CW, April 6, '57, p. 32*), starts with toluene, which is first oxidized to benzoic acid, then converted into a potassium salt. The benzoate is later disproportionated to yield benzene and dipotassium terephthalate. Acidification of the latter produces free terephthalic acid.

Henkel has also developed an alternate method involving the isomerization of phthalic acid. The direct conversion of benzene resulted from a series of experiments touched off by the discovery that other benzene-dicarboxylic could be converted into terephthalic by high temperature and pressure in the presence of potassium carbonate and catalysts. Later, Henkel found that a number of aromatic and heterocyclic compounds—chiefly amides or nitriles—can be made into dicarboxylic acids under similar conditions.

**A new steelmaking process that bypasses the blast furnace** was revealed at the dedication of Republic Steel's \$5-million research center in Independence near Cleveland last week. The process converts highly purified, powdered iron oxide to strip steel by compressing it between rollers, heating it to 2200 F in a furnace, then hot-strip rolling it to desired thickness.

The steel is pickled, cold rolled and annealed in the conventional manner. But the process eliminates blast furnace, open hearths, coke ovens and blooming mills. Although Republic says a commercial plant is about six years away, more than 1,800 lbs. of steel have been produced in the laboratory. Quality, the company claims, is equal to that produced conventionally.

Republic has been researching blast-furnace bypassing techniques for some time (*CW, Jan. 26, '57, p. 94*). It has been working with National Lead on the R-N process, which reportedly has no connection with the present development. The new process starts with high-purity iron oxide, the R-N process with lower-grade ores.

**The most potent progestational drug yet developed.** That's how Upjohn refers to the synthetic hormone, medroxyprogesterone (Provera). The new drug, discovered by researchers of the Upjohn Co. (Kalamazoo, Mich.), could be useful in preventing miscarriages. Upjohn says it is the only compound known to maintain normal pregnancies, at extremely low doses, in experimental animals deprived of a natural source of the vital hormone progesterone.

# Technology

## Newsletter

(Continued)

**Glass-fiber-reinforced polyester chain has been developed** by Kettenwerke Schlieper, GmbH (Gruene, Westphalia, Germany). Said to be lighter in weight but comparable in strength to steel chain, the new chain features corrosion resistance, costs more than regular steel, less than chromium-nickel steel.

**Chemical methods of upping the yield of cotton plants** are covered in two new patents (2,889,662 and -663) assigned to Rohm & Haas. They involve production of hybrid cottonseed by chemically inducing male sterility. Two or more different varieties of cotton are planted near each other, then one variety is chemically treated. The treated variety, unable to fertilize itself, is pollinated by the untreated plants, producing superior hybrids. To induce sterility, cotton plants prior to flowering are treated with a chlorinated compound, which, in water-solution, forms the anion of a chlorinated aliphatic carboxylic acid containing from two to four carbon atoms per molecule and at least two chlorine atoms.

**An auto exhaust purifier will be developed** by Chrysler Corp. (Detroit) and Ramo-Wooldridge Division of Thompson Ramo Wooldridge Inc. (Los Angeles). The device, unveiled earlier this year by R-W (CW, Jan. 31, p. 74), is an afterburner said to be capable of removing at least 90% of the hydrocarbons in the exhaust. But more study is needed to reduce its size (e.g., bulky shielding and insulation) and cost.

**Petroleum-derived carbon is replacing coconut-shell charcoal** throughout the entire line of activated carbon products made by National Carbon Co., division of Union Carbide Corp. Although coconut-shell charcoal has previously been the only acceptable source of premium-grade absorbent, National Carbon reports that petroleum-derived material has higher activity, can be made to sell at substantially lower prices. Cost of the most commonly used grade, for example, has been reduced from \$1.10/lb. to 58¢/lb., in quantities of 2,000-25,000 lbs. The switch to petroleum carbon also permits National Carbon to offer larger quantities at lower prices.

**Electrodialysis to convert saline water into fresh water** will be used by the third U. S. government conversion demonstration plant. Location of the 250,000-gal./day project to convert brackish water will be in the northern Great Plains or the arid areas of the Southwest. The office of Saline Water has not yet estimated either the cost of the plant or the cost per 1,000 gal. of using the electrodialysis process. Research on dialysis membranes has been carried out largely at the Denver laboratories of the Bureau of Reclamation.

The government's \$10-million saline-water program calls for two of five demonstration plants to be used for purifying brackish water, the other three for sea-water conversion. Processes announced for two of the sea-water plants are long-tube vertical distillation and multieffect flash evaporation. Site for the first plant will soon be selected (see p. 33).



Five large mounds of solar salt, harvested from huge ponds of salt water at a Morton plant in the West, await shipment to industry.

## Only Morton offers salt service to industry everywhere in America

Morton, the only nation-wide salt company, has salt sources, sales offices and warehouses from coast to coast. This means Morton can offer you complete salt service whether you have just one plant or several plants in different states.

Morton produces, refines and delivers nearly 100 different grades of salt to industry for 14,000 different uses. This means you can get expert, *impartial* advice on which grades will do the best job for you.

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Morton sales representatives are backed by the services of their own ultra-modern salt research laboratory—the most complete laboratory of its kind in the world. This means you can get complete technical assistance on any problem relating to salt. This service help alone may be worth thousands of dollars to you every year.

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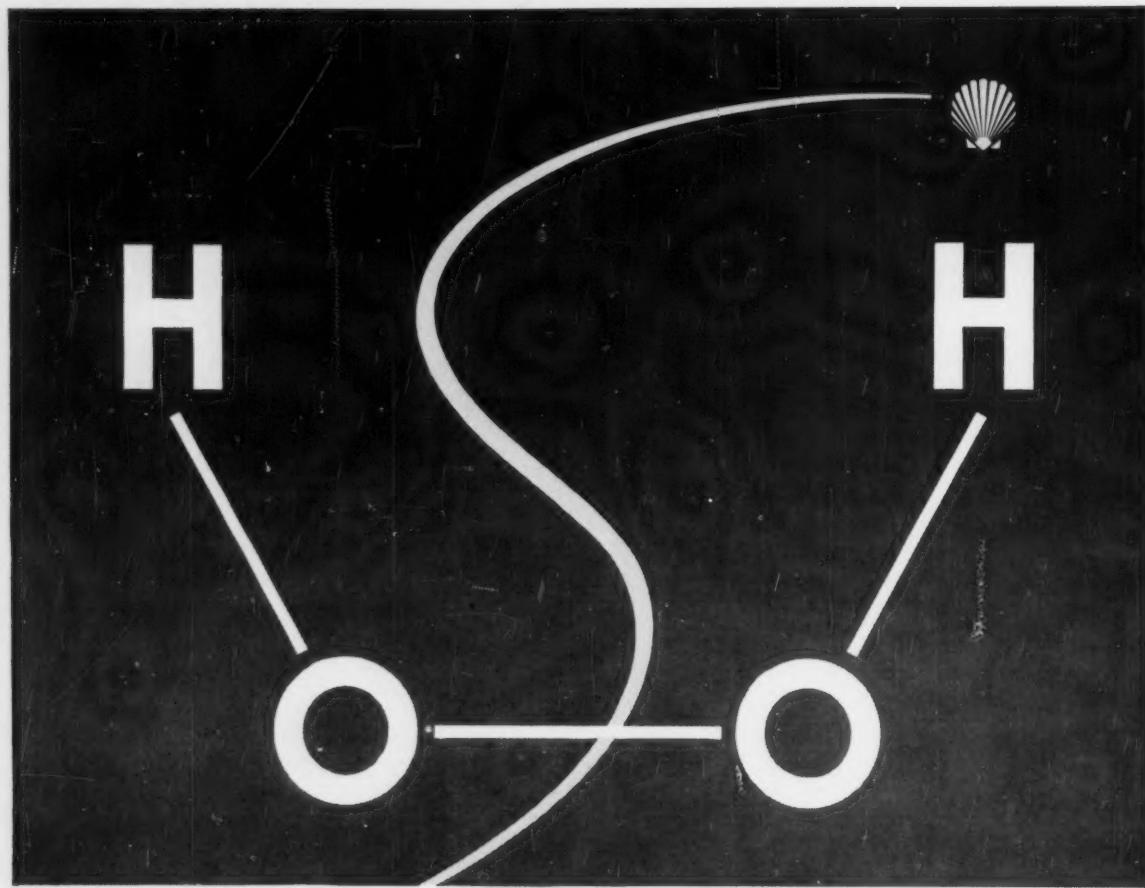


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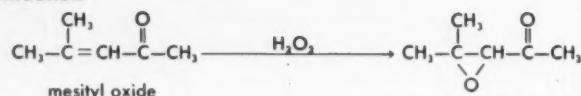


# **H<sub>2</sub>O<sub>2</sub>... practical source of oxygen for chemical synthesis**

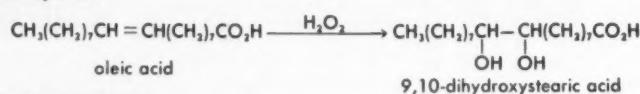
**T**HE LIST of uses for hydrogen peroxide in chemical synthesis is growing steadily. If you manufacture plasticizers, resins, insecticides, or organic intermediates, you will find hydrogen peroxide a ready means for adding oxygen.

Hydrogen peroxide reacts under a variety of conditions and with a wide range of organic substances. Practical reactions include epoxidation, hydroxylation, peroxidation, and amine oxide formation. Examples are:

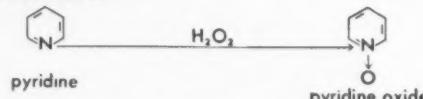
## Epoxidation



### Hydroxylation



### N-Oxide Formation



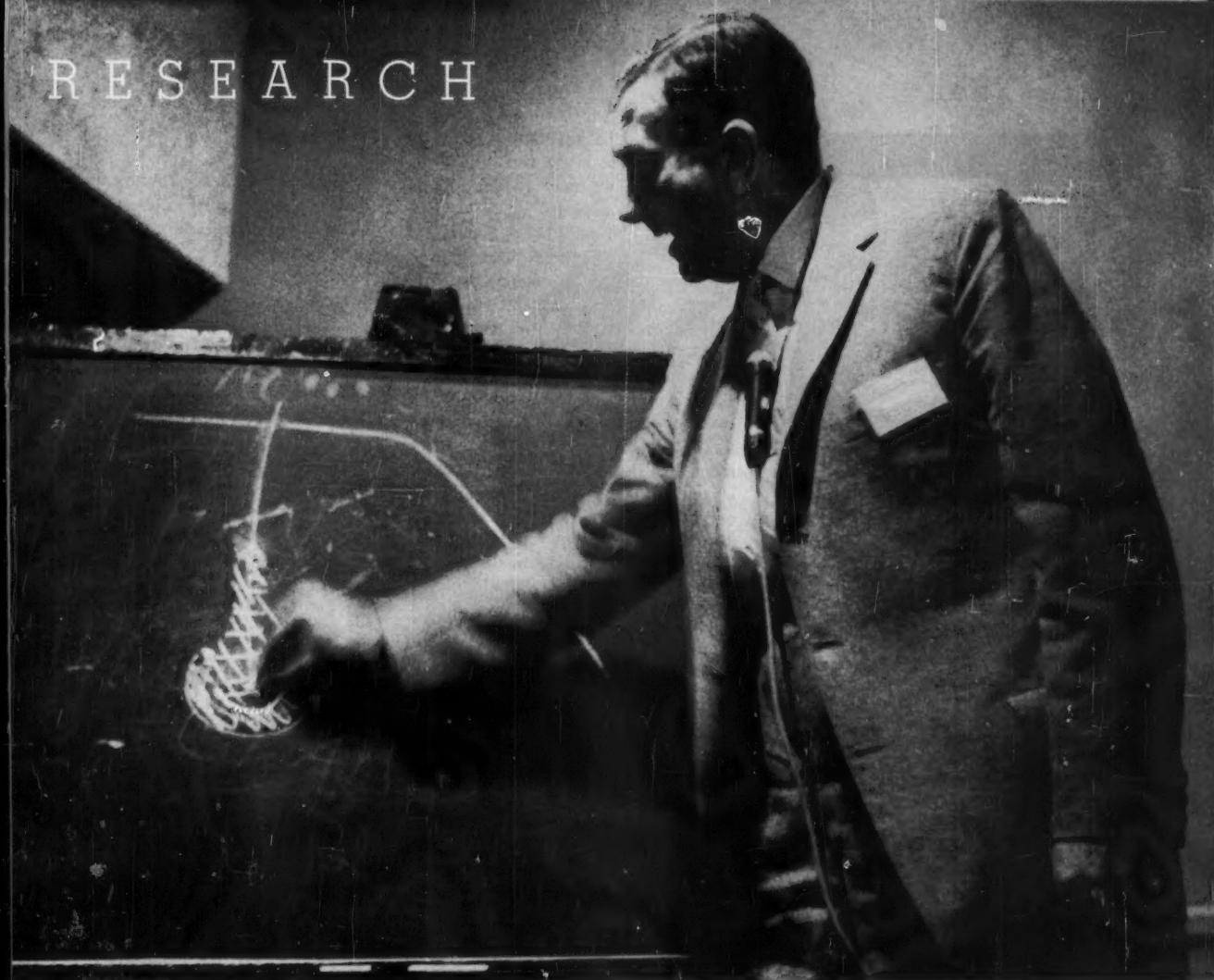
**Shell Chemical's laboratory facilities and field staff are at your disposal to help with problems in using, storing, and handling hydrogen peroxide. Phone or write for more information.**

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# RESEARCH



Physicist Edward Teller entertains high hopes that nuclear blasts will yield commercial chemicals.

## Taking Stock of Tomorrow's Resources

The recently concluded Southern Research Institute conference—theme: "The Undiscovered Earth"—drew a covey of advanced thinkers to Birmingham, Ala., where industry men and theoreticians swapped some free-wheeling ideas on how to tap the earth for more materials and energy. The show's star attraction: H-bomb pioneer Edward Teller, director of the University of California's Radiation Laboratory (Livermore).

Teller gave conferees a peek into his well-filled bag of atomic age tricks.

Among his fondest hopes for the future is the use of nuclear explosives to uncover minerals and synthesize chemicals in the ground. "Big explosions would cost only 2¢/cu. yd. for earth removal," says Teller. "For a

small cost, we could remove 200 ft. of earth. This would expose deep-veined materials for cheap strip-mining."

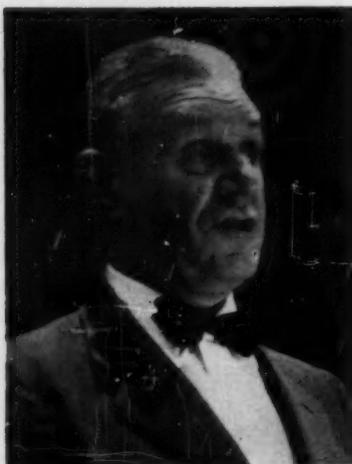
Chemicals from nuclear explosions is another Teller dream. One possibility: heating alunite (hydrous potassium aluminum sulfate mineral) to 650 C, where it breaks down to potassium sulfate. "An explosion could break down the alunite so that the potassium sulfate could be washed up to ground level. This would furnish a tremendous supply of this material for fertilizers," he reasons.

Teller also conjectures that if nuclear explosion experiments to liberate oil from Canada's Athabaskan sands are fruitful, the area will be "as rich [a producer] as the Near East."

On using nuclear blasts for power, he says: "We need to find a way to store this tremendous power. One way might be to heat salt, with an explosion, then bring the energy up in an agent such as water. A power plant on such a site would operate about a month [before] another underground explosion would be necessary. We need to design a reusable explosion chamber."

Shell Development Co. geology consultant M. King Hubbert gave the conference these predictions on the future supply of fuels: "Projecting the coal-production curves for the world into the future, a culmination in the consumption of coal should occur about 200 years hence. It appears that the peak of world produc-

## RESEARCH



Union Carbide's Kinzel sees technology easing future shortages.

tion of crude oil should occur about the year 2000; for the U.S., not too far from '65."

Like other conferees from the chemical process industries, Hubbert feels the problem of dwindling fuel reserves will depend on utilization of nuclear energy.

**No Emergency:** There's no hurry to turn up substitutes for strategic materials, however. Thanks to research, the supply of natural resources is probably a long way from being exhausted.

Union Carbide's vice-president of research, Augustus Kinzel, pointed out how technological advances are changing materials concepts. He told conferees, "I see no prospect of our running out of anything. We used to consider copper a unique product, largely because of its electrical conductivity. Now aluminum is widely used for conducting electricity."

He discounts assumptions in the Paley report (*CW, July 5, '52, p. 25*), which assumed pending dire shortages of iron, lead, zinc, and points out: "There's more known iron ore today than there was at the time of the Paley report. And lead and zinc markets are glutted."

Admitting that some metals and minerals might be in tight supply in the distant future, Kinzel predicts improved instruments (e.g., the airborne magnetometer) will help prospectors ease the shortage. "Then, too, there's oceanography," he said. "Manganese nodules on plateaus in the South Pacific test 28%. Today, manganese

(ore) has to be 48% to prove really interesting. But if we run out of the high grades, we may go after these South Pacific deposits."

Thomas Nolan, U.S. Geological Survey director, agrees with Kinzel.

Nolan looks for stepped-up research on subgrade and ultrasubgrade ores. He points out that "many elements seem to be distributed through the crust in such a way that there is an inverse relationship between the quantity or tonnage of material containing the particular element and the grade or concentration of the element." Current exploitation of low-grade uranium ore in the U.S. illustrates the profitability of this type of research, in his opinion.

Nolan also expects still more synthetics or substitutes to be developed, augmenting already familiar materials (e.g., refractory carbides, nitrides, borides, silicides).

Like the majority of conferees, he counts on further exploitation of natural resources to be accompanied by research in turning up useful new synthetics.

## Drug Forecast

The pharmaceutical industry will spend about \$200 million on research and development this year, some \$30 million more than last year, says Ernest Volwiler, former chairman of the board of Abbott Laboratories International Co. At recent commencement exercises at the University of Illinois (Chicago) professional colleges, Volwiler said the industry puts 5-8% of its sales dollars into research, "a higher rate than any other industry."

Last year, pharmaceutical companies tested about 115,000 substances, of which only 1,900 — or about one drug out of 60 — reached the clinical testing stage. This, he added, resulted in the market introduction of 20-30 new drugs, "each representing a large effort in research and development." Only a few of these will be fully successful commercially, he pointed out. By '63, perhaps earlier, Volwiler indicates, drug researchers will have come up with a superior hypotensive agent (for low blood pressure), a cure for cancer, a better psychic energizer, an effective agent against Gram-negative organisms.

## EXPANSION

- The John Crerar Library, one of the world's largest collections of technical, scientific and medical literature, will move to a new, larger building on the Illinois Institute of Technology (Chicago) campus. Illinois Tech and the Crerar Library will share the estimated \$1.5-2-million cost of the new building.

- Sylvania-Corning Nuclear Corp. (Bayside, L.I., N.Y.) has arranged to purchase a share in the French company CERCA (Compagnie pour l'Etude et la Realisation de Combustibles Atomiques), headquartered in Paris. The agreement, which is subject to obtaining necessary or appropriate government rulings and approvals, permits the New York firm and CERCA to share research and manufacturing techniques and technical information concerning fuel elements, control elements, shielding and blanket elements, and other components of the fuel cycle of nuclear reactors.

- American-Marietta Co. (Seattle, Wash.) recently dedicated its new research center located on Harbor Island, Seattle. Activities: research in plywood, composition boards, wet-strength and special papers, corrugated containers, pulp moldings, mineral wool, foundry cores and shell molds.

- Bids are in for construction of a metals development building by the U.S. Atomic Energy Commission as part of its Ames, Iowa, laboratory. AEC has budgeted \$1.9 million for the project. Land for the building has been leased from Iowa State College, which operates the Ames Laboratory for AEC.

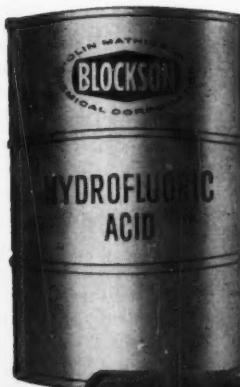
- Picker X-Ray Corp. (White Plains, N.Y.) has built a new \$1-million radioisotope and X-ray research center in Cleveland, O. The center will study the processing and packaging of radioisotopes for medical and industrial users and will seek new ways of using radiographic equipment.

- The Pennsylvania Industrial Development Authority has tentatively approved a new loan for construction of an atomic research laboratory to be occupied by Nuclear Materials & Equipment Corp. (Apollo, Pa.) in North Vandergrift, Pa. A staff of 65 is expected to occupy the new research laboratory, which will be

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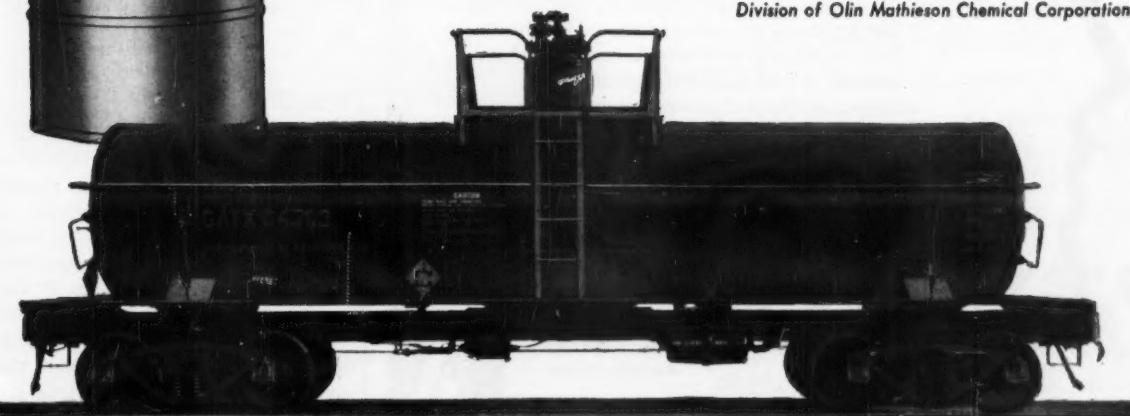


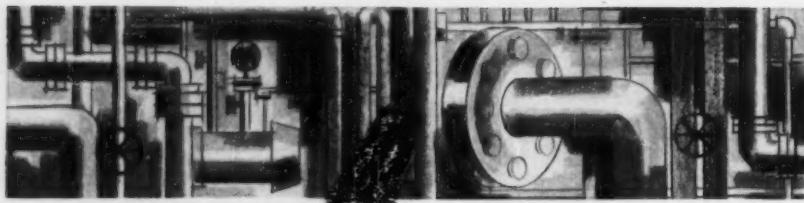
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## RESEARCH

equipped to handle all types of radioactive materials, including plutonium.

- Nuclear Consultants Corp. (St. Louis, Mo.) has established a West Coast division at 1717 South Victory Boulevard, Glendale 1, Calif. The firm specializes in radioisotopes for the medical profession.

- Air Reduction Co., Inc. (New York) plans to construct a test laboratory in Franklin Township, New Jersey. It will supplement Airco's central research laboratories at nearby Murray Hill, N.J. The new lab will house research on fuels and oxidizers, will have facilities for lab, prepilot, and pilot-scale operations. Completion is expected by late summer.

- Construction is under way on the U.S. Dept. of Agriculture's new North Central field research laboratory near Delaware, O. The lab is being financed by a \$350,000 fund appropriated by the 86th Congress. Projects will include development of systemic insecticides, studies of Dutch elm blight and other infectious and noninfectious shade-tree diseases, and probing the cause and control of root rots.

- Eli Lilly & Co. has dedicated a new agricultural research center at Greenfield, Ind.

- Columbian Carbon has opened its new carbon black and pigment division research center at Princeton, N.J.

- Chas. Pfizer & Co., Inc. (Brooklyn, N.Y.) plans to build a poultry diagnostic laboratory at Cullman, Ala.

- National Patent Development Corp. is a new firm equipped to aid corporate clients in the selling or licensing of patents and processes. Offices are at 68 William St., New York 5, N.Y., and at 1000 Connecticut Ave., Washington, D.C.

## PRODUCTS

**Better Butyl:** U.S. Rubber is licensing its butyl rubber vulcanization process. The process uses phenol dialcohol resin, instead of sulfur, as the butyl curing agent. Resin-cured butyl withstands 400 F for sustained periods, compared with 300 F for standard butyl, 275 F for GR-S, and 250 F for natural rubber. It is being used in tire curing bags (which are said to last five times as long as standard butyl bags), in steam hose,

### A LEADER IN BIOCHEMICAL RESEARCH

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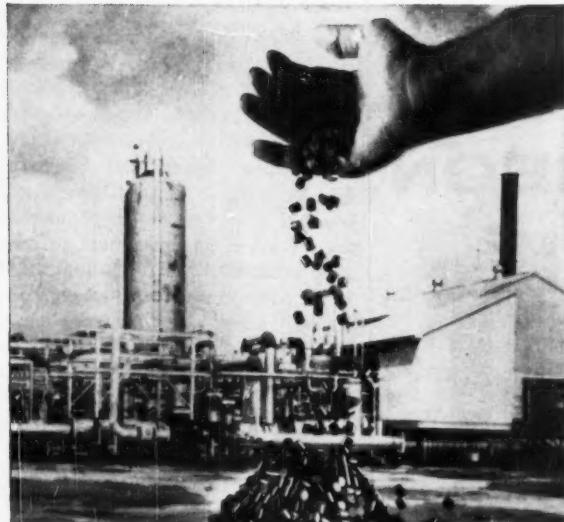
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# GIRDLER G-43

## Hydrogenation Catalyst

*...improves reduction of  
oxides of nitrogen  
...lowers costs*



CATALYSTS FOR:  
HYDROGENATION  
SYNTHESIS GASES AND  
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DESULFURIZATION  
NEW CATALYTIC PROCESSES

**Applications.** Girdler G-43 Catalyst is a platinum base catalyst for promoting the reaction of *oxides of nitrogen* with hydrogen, carbon monoxide, natural gas, propane or other hydrocarbons... also between *oxygen* and hydrogen, carbon monoxide or hydrocarbons. Its superior activity and physical properties make G-43 the most effective, commercially available catalyst for the catalytic decomposition of nitric acid plant tail gases.

**Commercial experience.** Highly active, G-43 is making possible the reduction of oxides of nitrogen in tail gases to levels as low as 10 ppm. Extremely rugged, it is proving ideal for use in plants where power recovery turbines are employed. When hot, has been exposed to air *without the usual increase in catalyst temperatures*. Has been exposed to temperatures as high as 2500°F without disintegrating or losing activity.

*Experience proves G-43 can pay for itself from performance savings within three months.* Estimated life is more than two years.

**Operating and physical characteristics.** G-43 initiates reactions between *hydrogen* and oxides of nitrogen or oxygen at a temperature of 400°F... and between *natural gas* and oxides of nitrogen or oxygen at 800°F. In some cases, an excess of natural gas should be added to initiate reaction; then its flow can be reduced to near stoichiometric quantities. Carbon monoxide and other hydrocarbons may also be used.

It can be operated at an hourly space velocity as high as 50,000 vols./vol.; for optimum performance, 20,000 to 30,000 is recommended.

G-43 has a bulk density of 55 to 60 lbs./cu. ft. It is available in pellets of  $\frac{1}{4}'' \times \frac{1}{4}''$  and  $\frac{3}{8}'' \times \frac{3}{8}''$ .

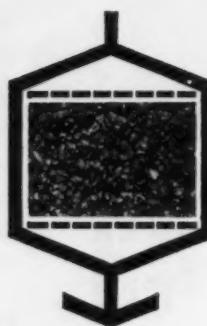
Find out how G-43 and other Girdler Catalysts with our Technical Service can improve your processing. Write for free copy of Catalog 2000.

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CHEMICAL PRODUCTS DIVISION • CHEMETRON CORPORATION



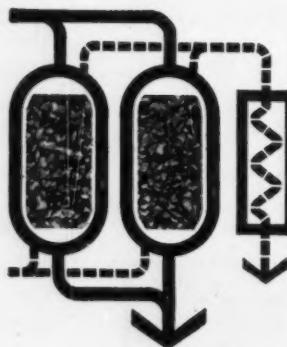
# ACTIVATED CARBON

**purifies** liquids and gases; eliminates tastes, odors, chlorine, and a wide range of contaminants from liquids and solutions. Decolorizes and deodorizes liquids. Raises the standards of purity for many industrial gases. Removes undesirable impurities. Permits recovery, re-use, or resale of by-product gases. Effective for difficult gas separations. Save on heating and cooling by recirculating air through activated carbon filters. Improve comfort and safety in living and working spaces.



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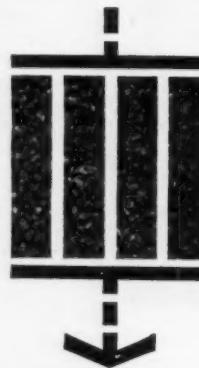
**recovers** solvents at a fraction of the original cost. Activated carbon absorbs solvents from air. Helps improve products by making the best solvents economical to use. We engineer and build complete solvent recovery systems in addition to supplying bulk activated carbon. Stops pollution, removes contaminants from exhaust air or liquid effluent. Recovers by-products.



# ACTIVATED CARBON

**catalyzes** and serves as a catalyst support. Speeds oxidation-reduction reactions, chlorinations, and hydrogenations—the key to vinyl chloride production. We supply all grades of activated carbons made to strict quality standards and provide prompt regeneration service. Barnebey-Cheney, Columbus 19, Ohio.

Ask for literature J-46 for your file. Send us your problem to solve.



# Barnebey Cheney

## RESEARCH

conveyor belts for moving hot materials, hydraulic press diaphragms, and in a variety of other products.

**Rubber Chemicals:** Five rubber vulcanization accelerators for latex and butyl compounding are now available from the rubber chemicals department of American Cyanamid Co. (Bound Brook, N.J.). They are zinc dibutyl-dithiocarbamate and zinc diethyl-dithiocarbamate (marketed as Cyzate B and Cyzate E, respectively); zinc mercaptobenzothiazole (ZMBT); and the monosulfide and disulfide of tetramethylthiuram (Cyuram MS and Cyuram DS).

**Tungsten Carbide:** Samples of tungsten carbide made by a new process are offered by Union Carbide Metals Co., New Products Engineering Division (P.O. Box 330, Niagara Falls, N.Y.). Using the new powder, cutting tool fabricators reportedly can produce cemented, sintered or cast inserts with a minimum of processing. Conventionally, pure tungsten metal is the raw material.

## LITERATURE

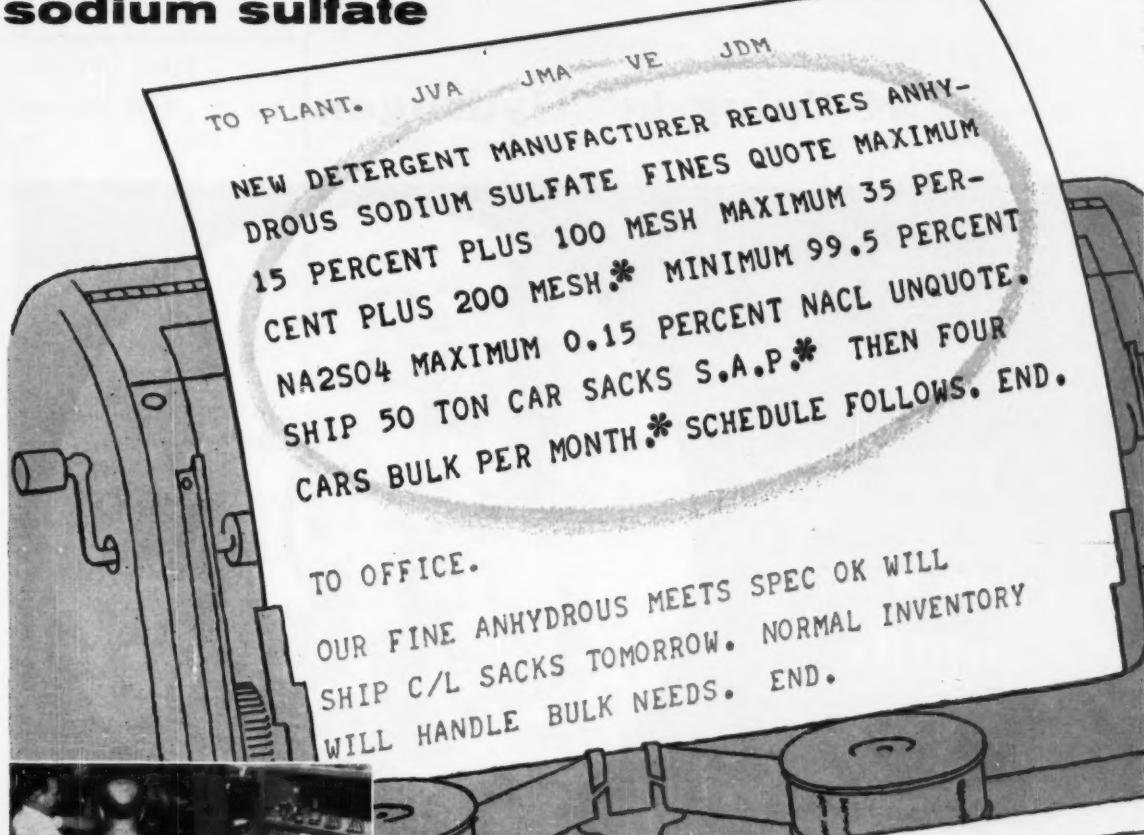
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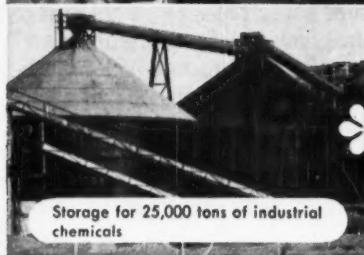
- Technical Bulletin I-14R (revised) on caprolactam, offered by the Allied Chemical Corp., National Aniline Division (40 Rector St., New York 6, N.Y.), discusses physical and chemical properties of the monomer and its uses in textiles, cordage, plastics, films and foils, coatings, treated papers, photographic emulsions, leather, adhesives, rubber, printing pastes and dyes, lubricants, solvents, and organic synthetics.

- A gas chromatography literature abstracting service is now offered by Charles Lowry, Jr. (80 East Jackson Blvd., Chicago 40).

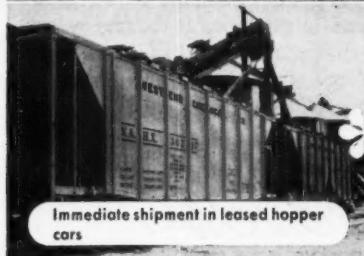
# West End "fills the order" for special specification anhydrous sodium sulfate



Constant control for uniformly high quality



Storage for 25,000 tons of industrial chemicals



Immediate shipment in leased hopper cars

Through a system of instant communication between sales office and plant and the efficient coordination of technical, production and shipping activities, West End can make prompt commitments to meet particular specifications and delivery requirements.



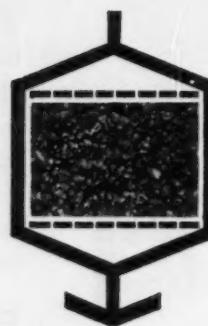
**WEST END CHEMICAL COMPANY**

DIVISION OF STAUFFER CHEMICAL COMPANY

EXECUTIVE OFFICES, 1956 WEBSTER, OAKLAND 12, CALIF. • PLANT, WESTEND, CALIF.

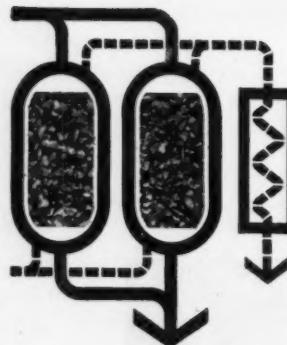
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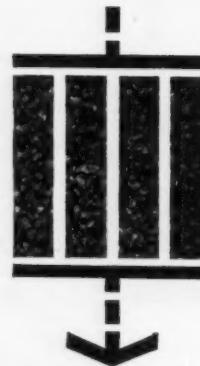
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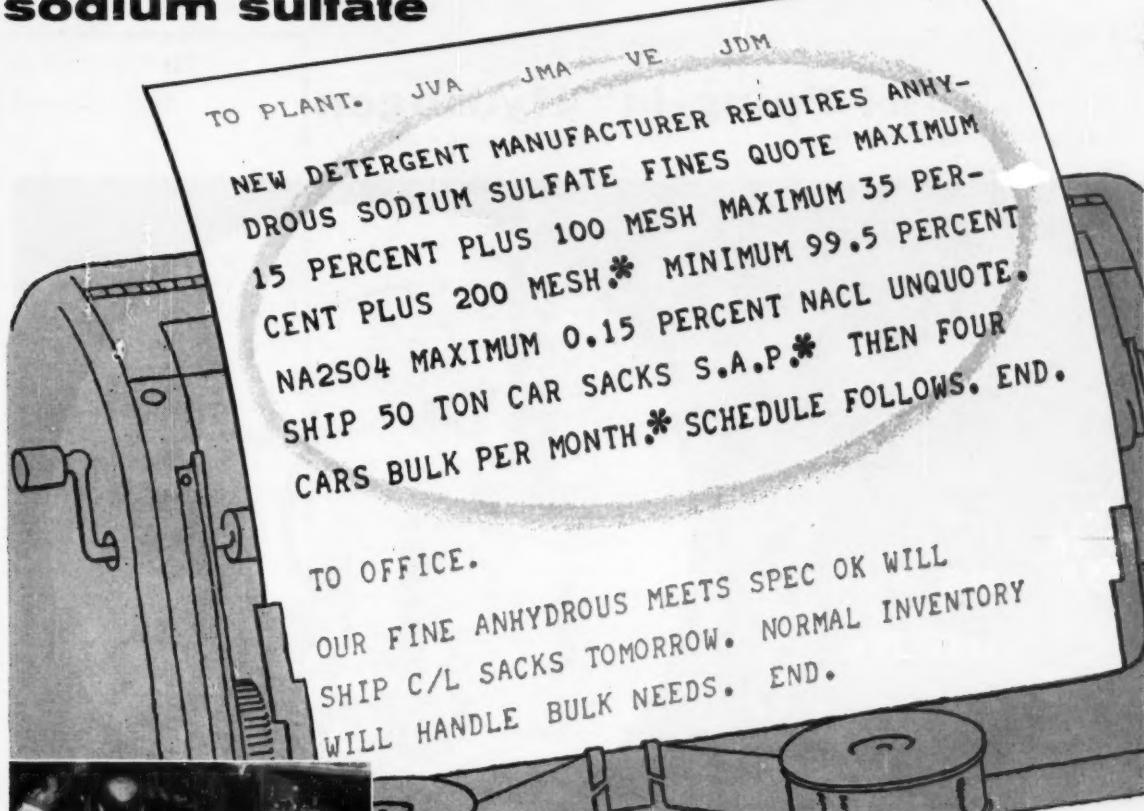
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# Market Newsletter

CHEMICAL WEEK  
June 27, 1959

**Reichhold Chemicals' phthalic anhydride price boost—from 17¢ to 19¢/lb.** (*CW Market Newsletter, June 20*)—has not set a pattern. Reichhold is determined to establish a higher price than the 17¢ tag promised by Amoco Chemicals (*CW Market Newsletter, Jan. 31*)—but the 15-day notification period required by most quarterly contracts expired last week without boosts being posted by other producers.

This leaves RCI as the only producer with a premium 19¢/lb. tag on its PA, and industry observers are now wondering how long the firm can make it stick. But there are some indications that RCI's position is stronger than expected. Another phthalic marketer says demand for the chemical has increased about 30% in the past 60 days and, in his case at least, it will be a struggle to keep up with orders in the next few weeks.

**Such improvement of phthalic anhydride market strength—if it holds up—will no doubt increase industry discontent about the 17¢/lb. price level.**

One phthalic marketer says that most of the industry is "coming to the conclusion that you can't make any money on PA at 17¢," and that many sellers are doing little more than trading dollars. Hence, there's a chance that at least some other producers will go to higher phthalic tabs when current contract commitments are fulfilled.

**Higher prices of related chemicals are expected if a price increase on phthalic anhydride becomes industry-wide.** Naphthalene, for example, is already in a tightening supply position because of the threatened steel strike—which in itself could force higher tabs on the chemical; increased phthalic anhydride prices would make at least a 1¢/lb.—perhaps bigger—hike on naphthalene virtually a certainty.

**Higher tabs on phthalic-derived plasticizers and phthalic resins** would also likely reflect any general upping of PA prices; they were shaved earlier this year when phthalic slipped to 17¢/lb. (*CW Market Newsletter, Jan. 31, Feb. 7*).

**Price cuts on a liquid dicarboxylic acid anhydride** that run as high as 25% have been made by Heyden Newport. The material, called Beta-S, is used as epoxy resin catalyst and as a chemical intermediate. It was introduced earlier this year.

Prices effective June 15: in 55-gal. drums, truckloads, 75¢/lb.; 5,000-lb. lots, 76.5¢/lb.; less-than-5,000-lbs., 80¢/lb. In 15-gal. drums, in those quantities, prices are 77¢, 79¢, 83¢/lb., respectively. Reductions from original "sample" price of \$1/lb. result from move to semiworks production.

# Market

## Newsletter

(Continued)

**About 709 million lbs. of plastics were used in construction in '58,** according to a study completed by market analysts of Monsanto Chemical's Plastics Division. This total does not, however, include an additional 266 million lbs. of alkyds and rosin modifications used in paints.

Here's how total consumption breaks down (million pounds): acrylics (lighting, paint), 12 million lbs.; melamine and urea (plywood bonding, high-pressure laminates), 66; phenolics (plywood, insulation, wiring, etc.), 155; polyester (panels, pipe, plumbing), 19; polyethylene (wire coating, insulation, pipe), 110; styrene (wall tile, insulation, paints, lighting), 140; vinyls (wire coating, wall covering, flooring, pipe, lighting), 207.

**Output of plastic bottles and tubes increased about 8%, to 440.8 million units in '58 from 407 million units in '57,** says the Plastic Bottle and Tube Manufacturers' Institute. (All figures include bottles and tubes with capacities up to 1 gal.). More than 18.5 million lbs. of polyethylene—regular and linear—were used in '58.

**Production stoppage and capacity expansion** mark the paradoxical status of Western Nuclear's uranium operations. Mill operations at Jeffrey City, Wyo., have been shut down because of overproduction of concentrated yellow cake. Enough has been made to supply present contracts. Meanwhile, an AEC-authorized capacity expansion of mine operations from 440 tons/day to 845 tons/day is being pushed toward completion by early August.

**Before the week is out, U.S. natural pyridine prices** will match the tag on the synthetic material. Reilly Tar & Chemical last week startled the trade with a 5¢/lb. cut on its synthetic pyridine and word is that natural producers—albeit reluctantly—will follow suit.

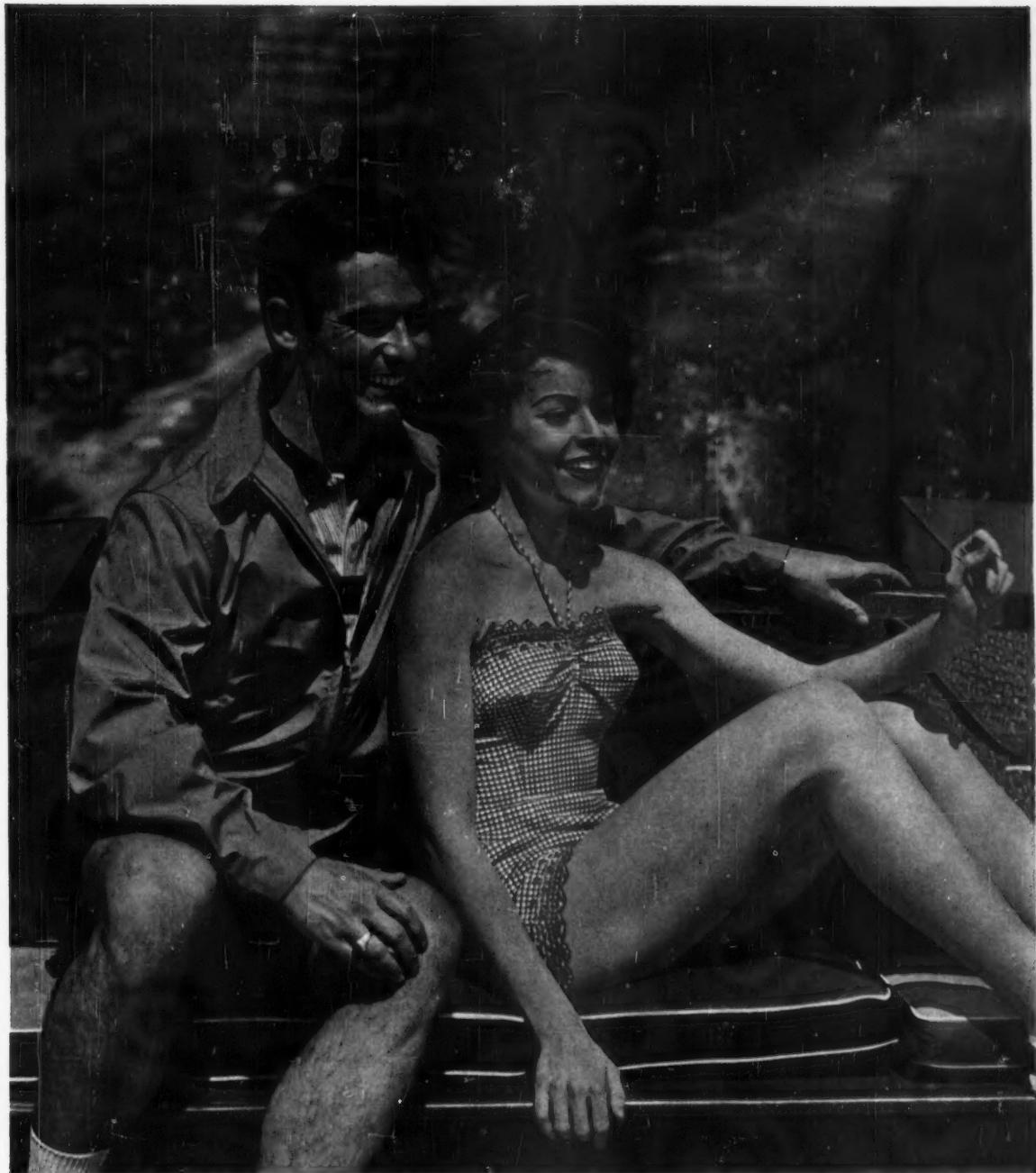
A steel strike of long duration could dry up 2-degree pyridine sources, leave makers with inventories cleaned out at lower prices.

The domestic cuts will probably have little effect on imports (selling at about 62¢/lb.), since prices on foreign material roll with demand.

### SELECTED PRICE CHANGES—WEEK ENDING JUNE 22, 1959

	Change	New Price
<b>DOWN</b>		
Blood, dried, 16-16½% ammonia, unit ton .....	0.25	5.75
Coconut oil, crude, tbs., N. Y. .....	0.0075	0.21
Mercury, metal, 76 lbs./flask, net-flask .....	2.00	240.00
Pyridine, 2-degree, tanks .....	0.05	0.65

All prices per pound unless quantity is quoted.



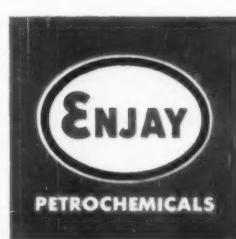
## *Synthetic fabrics that mean more fun afloat*

Enjay PARA XYLENE helps make the polyester fibers from which Dacron\* is made. New colorful sportswear gives long wear, dries quickly, stays neat and crisp in ocean spray and strong sunlight — even after many soakings in salt water. And after repeated machine washings, it needs little, if any, touch-up ironing. In textiles, and other industries, Enjay research works constantly to produce better products from petrochemicals. Can our research facilities help *you* produce a superior product? For more information and technical assistance, call or write the Enjay Company today!

### EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY

\*Dacron is Du Pont's registered trademark for its polyester fiber

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# Making sales...these Aerosol Containers from Canco!



All these products go to market dressed in the finest . . . Canco's famous Aerosol Containers!

If the sale of your product might benefit from aerosol packaging, there's good reason to turn to Canco. The development of the best aerosol container for your product requires skill . . . experience . . . and the right answers.

Canco recognized the potential of the aerosol container—and pioneered its growth. For instance, Canco developed the tab side seam to give its containers greater buckling resistance and bursting strength.

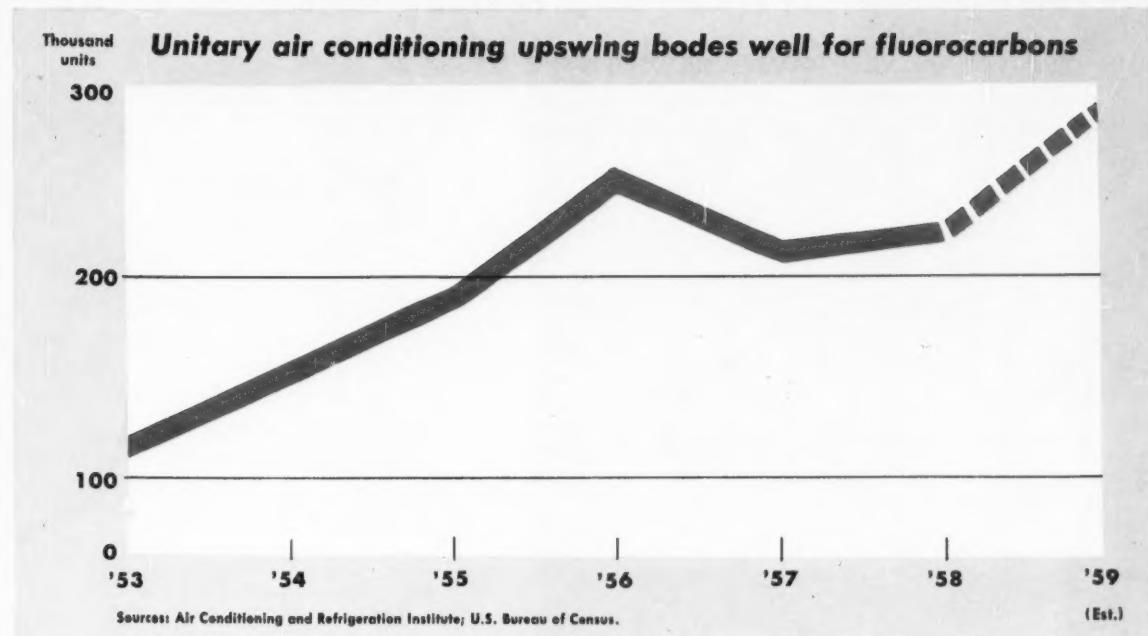
You'll find Canco experience in the field of aerosol packaging is unsurpassed. A call to your Canco salesman will put this skill to work for *you* and your product.

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# MARKETS



## Hot Days, Happy Days for Fluorocarbons

The current hot weather that has pushed air-conditioning equipment sales well ahead of last year's rates has meant two things for fluorinated hydrocarbon producers: a high level of sales of chemical refrigerants right now and brightened prospects for early realization of huge, as-yet-untapped refrigerant markets.

While refrigerant applications are, of course, one of the major outlets for fluorinated hydrocarbons, its relative market importance is changing. In '55, for example, 50% of total U.S. fluorocarbon consumption was by air-conditioning and refrigeration equipment. Of the remainder, 45% went into aerosols, 5% into miscellaneous applications. Since then, the rapid growth of aerosol products has reversed this pattern. Current estimates: about 50% of all fluorocarbon consumption is for aerosols, 40% for refrigerants, about 10% for miscellaneous applications.

But despite this switch, the growing refrigeration and air-conditioning market will continue to be a major outlet for fluorocarbons.

**Complex Market.** The big air-conditioner market is complex and difficult

to analyze, but some idea of its size is shown by actual equipment sales and estimates of chemicals needed to charge each type of unit.

For example, Carrier Corp. (Syracuse, N.Y.) estimates that the factory value of major air-conditioning products in '58 was about \$767 million; of this, \$500 million worth of equipment went to commercial and industrial markets, \$267 million worth to the residential markets. So far in '59, sales to both markets are running well ahead of first-half '58.

These growth trends are supported by market studies made by the Air Conditioning and Refrigeration Institute; statistics for unitary-type air conditioners reveal that shipments grew steadily during '53-'56. But in '57, the recession and unseasonably cool weather contributed to a 15.7% decline from the '56 high. During '58, however, shipments inched up again, to an estimated 224,000 units. The outlook is brighter for '59: shipments are expected to resume their pre-recession growth, reach an all-time high of 280,000 units.

Estimates of the long-range growth potential for fluorocarbons as refrigerants

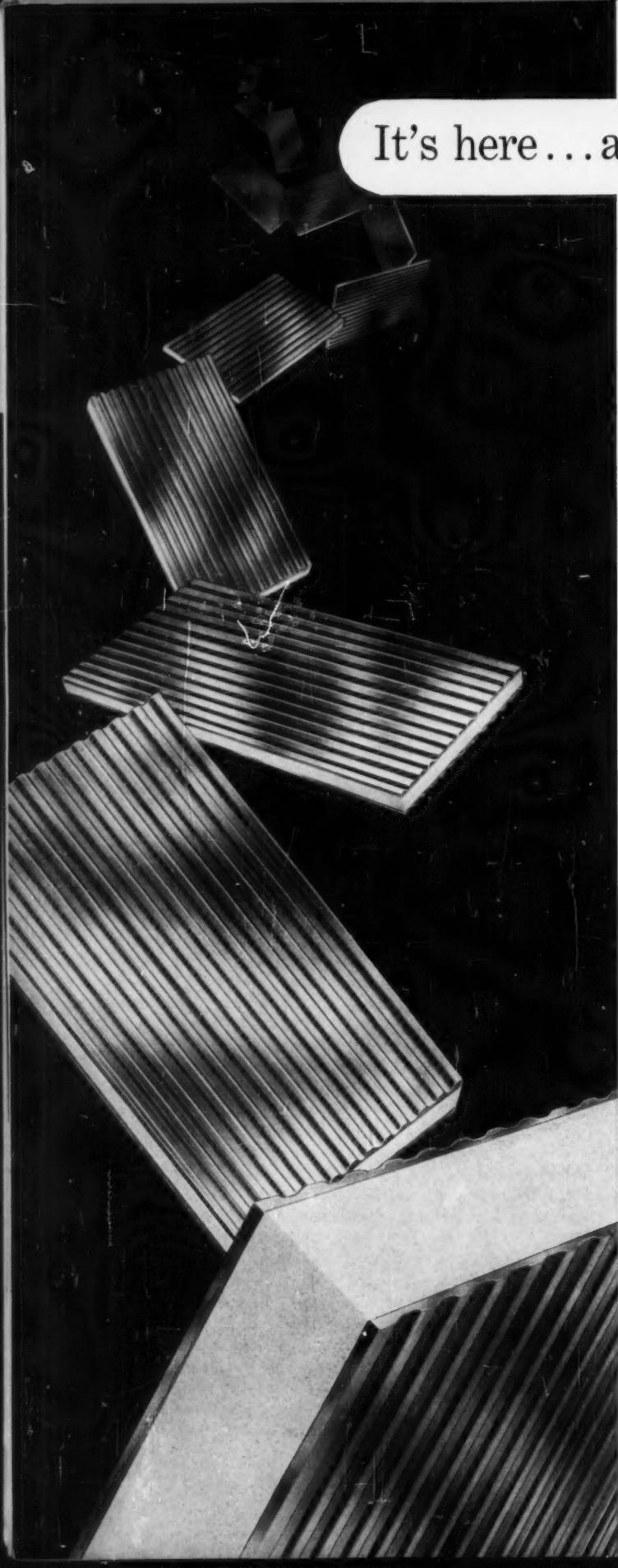
should take into account both new equipment and replacement sales.

Currently, manufacturers of new equipment are buying 25-30% of the fluorocarbons sold for refrigeration purposes. The rest is channeled largely through wholesalers to repairmen.

So far, probably less than 10% of the total potential market for original air-conditioning equipment — commercial or residential — has been tapped. As air conditioning gains acceptance as a "necessity" for comfortable living and working, more units will be installed. This clearly spells a steadily growing outlet for fluorocarbons, also indicates that the replacement market, dependent on original equipment sales, will show a steady growth, too.

**Centralized Growth:** The central residential unit market (i.e., those units centrally located—usually in the basement, garage or closet—and capable of cooling the full house) is a large outlet for fluorocarbons.

In '55 and '56, this segment of the market also moved into high gear but was slowed temporarily by the recession. Now the industry looks for '59 to shape up as one of the big years



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...for lower cost  
rigid foams

Improved humid aging characteristics and reduced water absorption for rigid urethane foams are advantages you obtain by using a new CARBIDE polyether—NIAX Triol LK-380. Developed by CARBIDE's research program on urethane intermediates, LK-380 produces a rigid urethane, lower in cost than polyester-based urethanes.

Wherever a low-density, foamed-in-place urethane polymer is required, LK-380 should be evaluated. It can be used in partial pre-polymer or one-shot systems. Applications for LK-380-based urethanes include insulation for refrigerators and freezers; acoustical tiles; fabrication of sandwich partitions for construction, non-sinkable boats, life buoys and deck guards.

Triol LK-380, like CARBIDE's other NIAX diols and triols, is made to rigid specifications, offering you custom control of urethane properties. They can help improve your flexible, semi-rigid, or rigid foams, elastomers, coatings, and adhesives. Order by tank car, tank truck, or in 55-gallon drums in carload or LCL lots. Remember, you save money on combination shipments in compartment tank cars and tank wagons.

Get specifications and other technical data on NIAX Triol LK-380 and other NIAX polyols from a Technical Representative in any CARBIDE office. Or write Dept. HW, Union Carbide Chemicals Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

**UNION CARBIDE  
CHEMICALS COMPANY**

DIVISION OF  CORPORATION

"Niax" and "Union Carbide" are registered trade marks of Union Carbide Corporation.

## Fluorocarbons Around the World

COUNTRY	COMPANY	TRADENAME
U. S.	E. I. du Pont de Nemours (Wilmington, Del.)	Freon
	Allied Chemical (New York)	Genetron
	Pennsalt Chemicals (Philadelphia)	Isotron
	Union Carbide (New York)	Ucon
England	Imperial Chemical Industries (Manchester)	Arcton
	Imperial Smelting (London, N. W.)	Isceon
France	Societe d'Electrochimie, d'Electro- metallurgie et des Acieries Electriques d'Ugine (Lyon)	CF
	Pechiney (Paris)	Flugene
	Farbwerke Hoechst (Frankfurt/Main-Hoechst)	Frigen
West Germany	Chemische Fabrik von Heyden (Munchen)	Fluogen
	V.V.B. Alcid Fluorwerk Dohna (Dresden)	Frigen
East Germany	Montecatini Societa Generale per l'Industria Mineraria e Chimica (Milan)	Algofrene
Italy	Nitto Chemicals Co. Ltd. (Tokyo)	Col-flon
	Osaka Kinzoku Kogyo Kabushiki Kaisha (Tokyo)	Daiflon
Netherlands	Uniechemie N. V. (Apeldorn)	Fresane
Spain	Produits Chimiques Industrial Comas Ing.	Flurion
Argentina	Fluoder S.R.L. (Lanus)	Algeon
	La Fluorhidrica (Buenos Aires)	Fration
Russia		Eskimon

for fluorocarbon sales in this market.

Many houses now under construction have central units (installed prior to occupancy), including privately built houses as well as development and apartment houses. Moreover, the market for central units also includes many older houses that did not have central units installed prior to occupancy.

An average central air-conditioning unit for a one-family house has a 3-ton cooling capacity, although 2- and 5-ton units are also widely used. For apartment houses, larger units are necessary. Although the amount of fluorocarbon used varies with the type and make of a unit, the average requirement is a little over 1 lb./ton of cooling capacity.

**Commercial and Industrial Outlets:**

In the '54-'57 period, the commercial and industrial air-conditioning market grew rapidly. According to a '57 Du Pont survey, about 50% of all existing installations were made in this period.

During the recession, this market—a broad area that includes drugstores, repair shops, restaurants, office buildings, motels, institutions, public buildings, industrial establishments and manufacturing plants—was also hurt by cutbacks in business outlays for plant expansions and modernizations. This year, sales are up again, as more equipment is being added.

Since commercial unit sizes range from  $\frac{1}{2}$  ton to more than 50 tons of cooling capacity, and the fluorocarbon needs vary from about 1 lb. to more than 2,000 lbs./unit, it's difficult, of course, to predict accurately the large volume of fluorocarbons consumed by this segment of the market.

**Residential Room Units Small:** Residential room units represent a small part of the air-conditioner fluorocarbons market. These units range in capacity from  $\frac{1}{2}$  ton to a little over 1 ton, with  $\frac{3}{4}$ - and 1-ton units accounting for the largest share of the market. Sales of room air conditioners in '58: an estimated 1.5 million units, about equal '57 sales. (Record sales of more than 1.8 million units were scored in '56.) Considering that the average room unit requires less than 1 lb. of fluorocarbon/ton of capacity, it is apparent that the present fluorocarbon market for this purpose is, at the most, 2 million lbs./year.

Since these units are not usually in

## MARKETS



### Mixing Speeds Going Up For Most Products — Costs Down

An increasing number of "problem" products are bending to the will of the Cowles, with its singular "Multi-Phase" Mixing Action. Here are some more eye-openers from Cowles' bulging file. They prove the point: Speeds are up, costs down.

#### Varnish Buy-Duts Out, Cowles In

National manufacturer who used to purchase varnishes from outside firm has joined the do-it-yourself movement with a Cowles. Now makes his own in 800 gal. batches, of dispersed rosin-modified phenolic resin in oil, without external heat. And he makes better than he bought—higher gloss, etc. Costs happily much lower than for best available product previously purchased. (1-Y)

#### Casein solutions in 1/3 the time

Another speed story. One processor cut costs this way: took one Cowles Dissolver, made 1000 gals. of solution of water, borax, ammonia and casein, and completed the batch in 50 minutes. Used to take 3 times the time and a lot more space. And end product has a solid content of 18%. (1-Z)

#### Clay scrap-slip blunging in 20 min.

It used to be agonizing. Now, with the Cowles, blunging of 100% wet wire-cut scrap is added rapidly and directly to tanks with water, in preparing slips made wholly of scrap. Concentrations are as high as 70-75% dry solids. Minimum batches of 215 gals. of smooth mixture are produced in 20 minutes ready for filter press. (2-A)

#### Hard cutting cold resins at high rate

Here's speed at high concentrations. The dissolving of 50% solids in solvent is accomplished by the Cowles at the rate of one pound each 3.5 seconds. End product in complete solution without residual or undissolved particles. (2-B)



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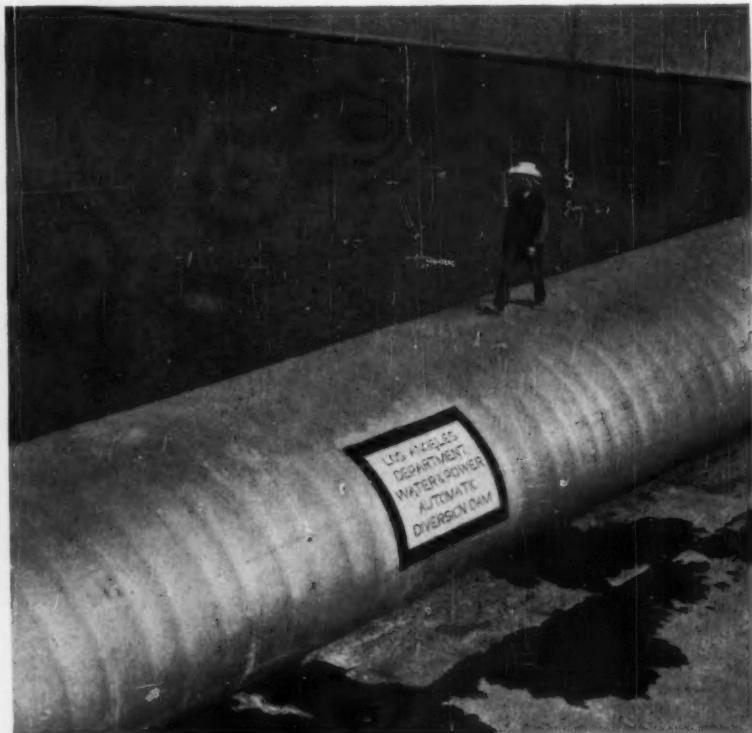
continuous operation and most carry five-year guarantees, this fluorocarbon replacement market is not now as significant, proportionately, as the larger unit market.

Nevertheless, total U.S. potential for the small room unit is still quite large and will be important in the total fluorocarbon market.

Meanwhile, fluorocarbons still find a large market in commercial refrigeration. Considerable amounts are needed for equipment used in freezer warehouses, railroad cars, trucks, meat and vegetable coolers, etc. And the continued growth of the frozen food industry will increase fluorocarbon demand from this source.

Home freezers and refrigerators are two other important outlets. Combined sales for these appliances range from 4 to 5 million units/year; fluorocarbon capacity, from 1 to 2 lbs./appliance.

Although the fluorocarbon industry is plagued with overcapacity (production in '58 was 200 million lbs. vs. an estimated industry capacity well over 400 million lbs.), industry men feel that refrigerant sales will continue to take large chunks of current output. And, with economic growth, plus new demands by the expanding air-conditioning market, fluorocarbons consumption could make significant gains on capacity.



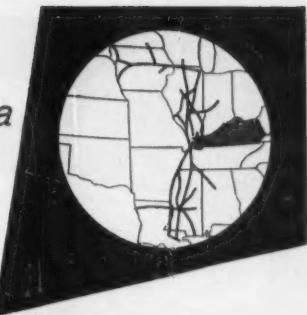
## Plastic Dam Against the Flood

A collapsible plastic dam has been installed in the Los Angeles River channel, near Griffith Park, to control the flow of flood waters. The tube-type dam, installed by the Los Angeles Dept. of Water and Power, is made of a neoprene-impregnated nylon fabric, with a special aluminum paint protective coating. The dam will divert the river onto adjacent ground,

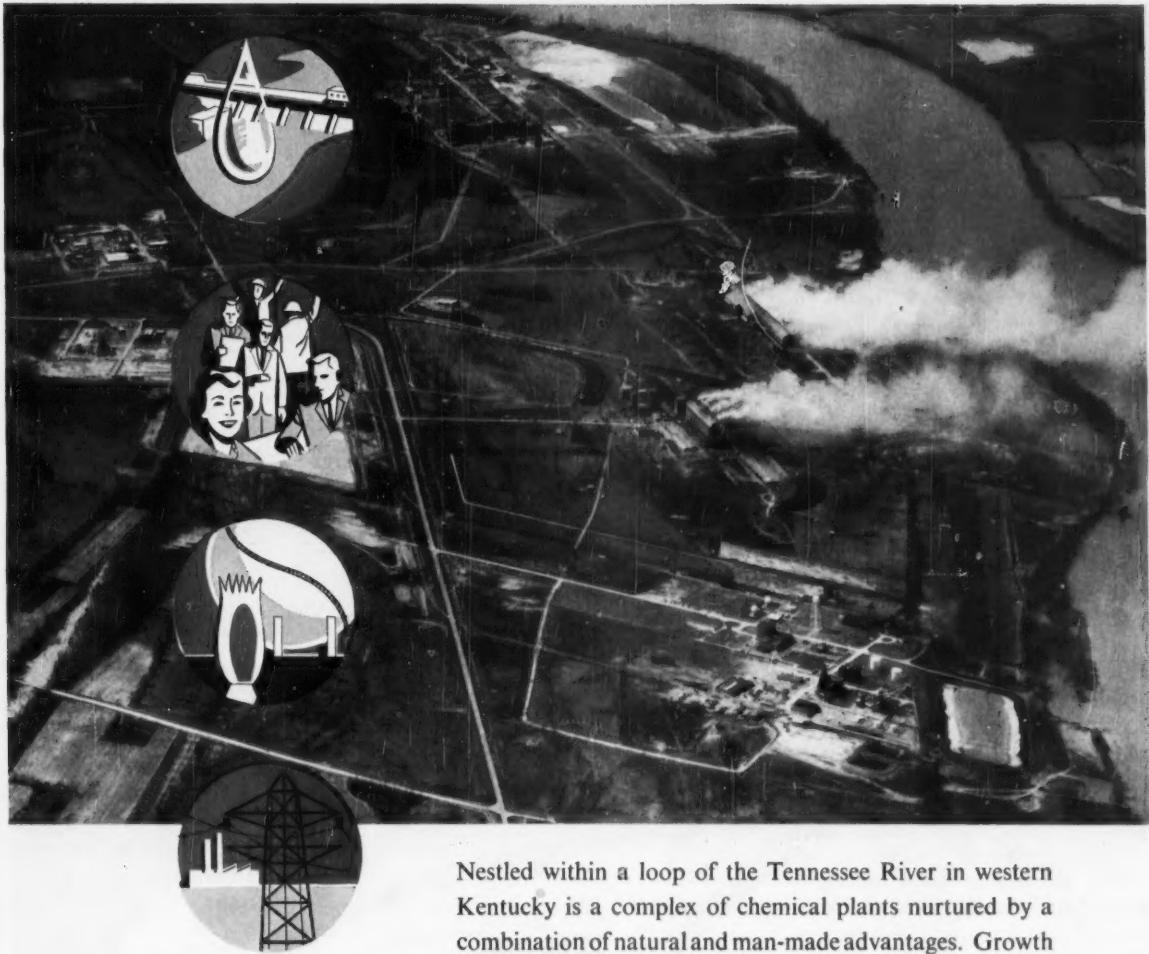
where water can percolate through the soil. Later, the filtered water will be recovered by pumping. During periods of heavy rain, the dam may be deflated. N. M. Imbertson, engineer in charge of operations for the city's water system, conceived the idea; Firestone Tire & Rubber Co. worked out the technical problems and handled fabrication.



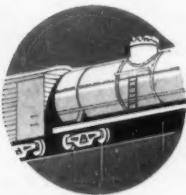
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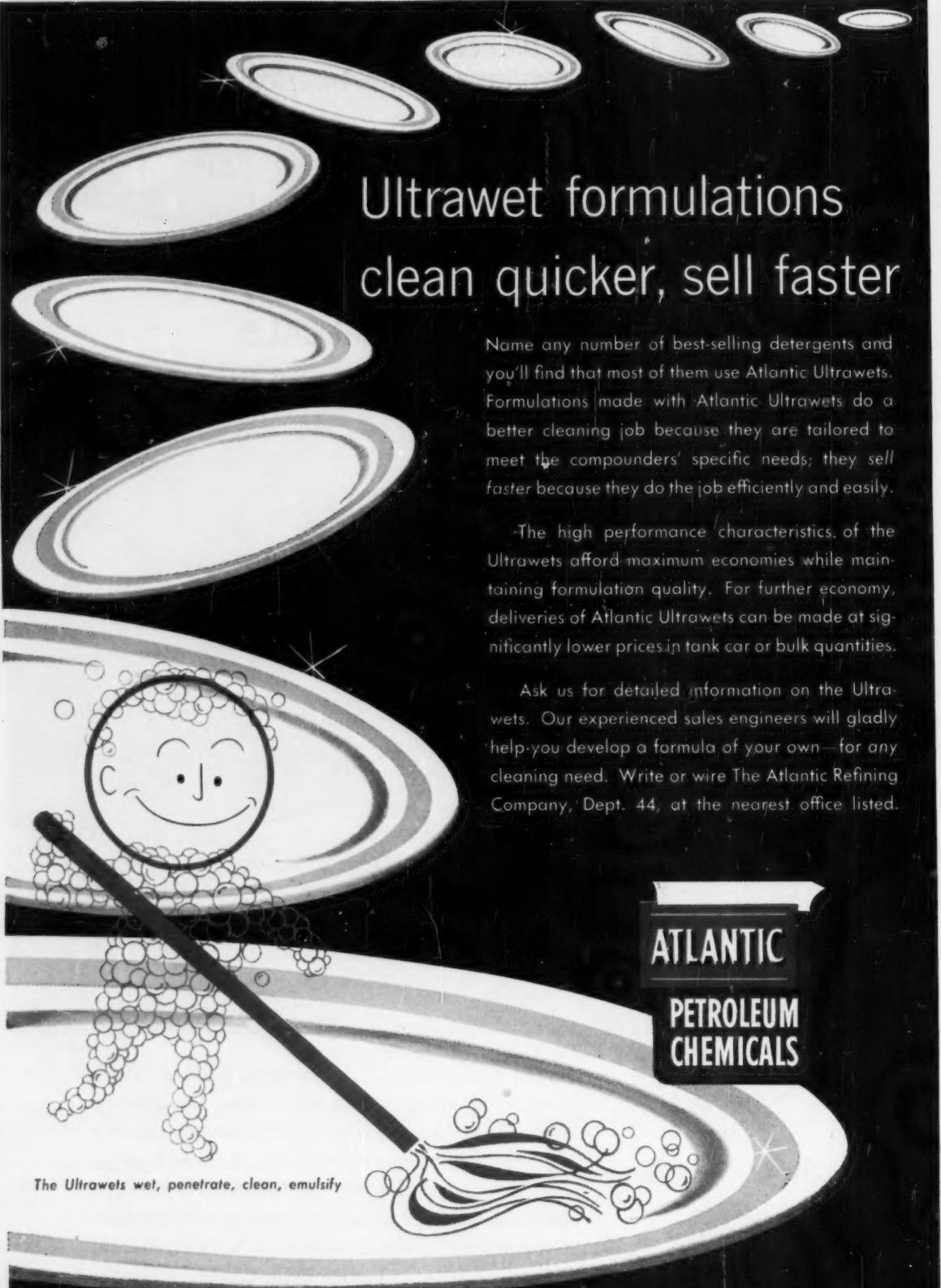


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of Brazil, Rio de Janeiro

# ENGINEERING



**SunOlin engineers (l. to r.) Lewis, Niece and McConkey go over design features of new urea plant.**

CW PHOTOS—LIONEL CRAWFORD

## Plant Model Doubles as Management Tool

**SunOlin** Chemical this week bypassed the ground-breaking ceremonies that traditionally herald a new construction project. Instead, it marked the official construction start of its 200-tons/day, Montecatini-process urea plant at Claymont, Del., with a "plant tour" through a colorful scale model recently completed in M. W. Kellogg's design engineering department.

SunOlin President James Harper and Vice-President S. S. Johnson foresee a promising future for the model's full-scale counterpart. As the first major urea plant on the East Coast, it will complement the other commercial operations of both of its corporate parents by using excess ammonia capacity of Sun Oil's largest refinery, to round out Olin Mathieson's line of fertilizer products.

**Management Tool:** The engineering models, because of their adaptability to a number of secondary roles, are proving to be a valuable management tool. For example, in addition to their primary function as a design tool, they aid in the planning of tie-in operations, maintenance and operating procedures.

Standing in for the \$8-million production unit, which is scheduled for completion early next year, SunOlin's model plant helped in many ways in the engineering of Claymont plant.

Designing process plants directly in three-dimensional scale models has become standard practice of several engineering companies. It saves considerable time and money by eliminating much of the preliminary drafting work formerly required. It also minimizes costs by enabling the de-

signers to spot required changes more readily than they might in ordinary plan drawings or piping isometrics.

Another of the plant model's important, though less publicized, uses is the role it plays in the client's review. Once the basic design has been worked out, the customer's engineers check the model to see that it conforms to their company's operating and construction standards. By discussing proposed changes from both the builder's and the operator's viewpoints, the engineers often come up with numerous cost-cutting modifications. For example, many catwalks, ladders, operating platforms, and the like, can frequently be eliminated by repositioning valves and other equipment components. And costly maintenance problems may be avoided by minor modifications that will enable

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## ENGINEERING



**SunOlin team reviews plant design from operating standpoint.**

the customer to use existing machinery for materials handling, replacement and repair.

**Lets Managers Manage:** The review of the SunOlin plant was handled by project manager of engineering and construction G. Boyd McConkey, project engineer F. K. Niece, and process engineer Gordon Cochran, all of Sun Oil Co.; and Olin Mathieson's project engineer, Kennett Lewis. Their consensus: "the use of engineering models lets managers really manage." Though all are experienced in the older techniques of engineering management, they heartily endorse the use of the model, which eliminates the time-consuming job of interpret-

ing hundreds of drawings generally required in engineering a multiunit plant.

After checking the model in detail, SunOlin's engineers went over the suggested changes one by one with Robert Jacks, Kellogg's project manager. Some results of this engineering teamwork:

- A building housing the compressors was modified to include provisions for more extensive overhead-crane facilities, tailored to SunOlin's equipment and conventional maintenance practices.

- Piping on the 200-ft.-tall prilling tower structure was altered in one place to eliminate the need for ex-



**Jacks (left), Lewis iron out details of construction changes.**

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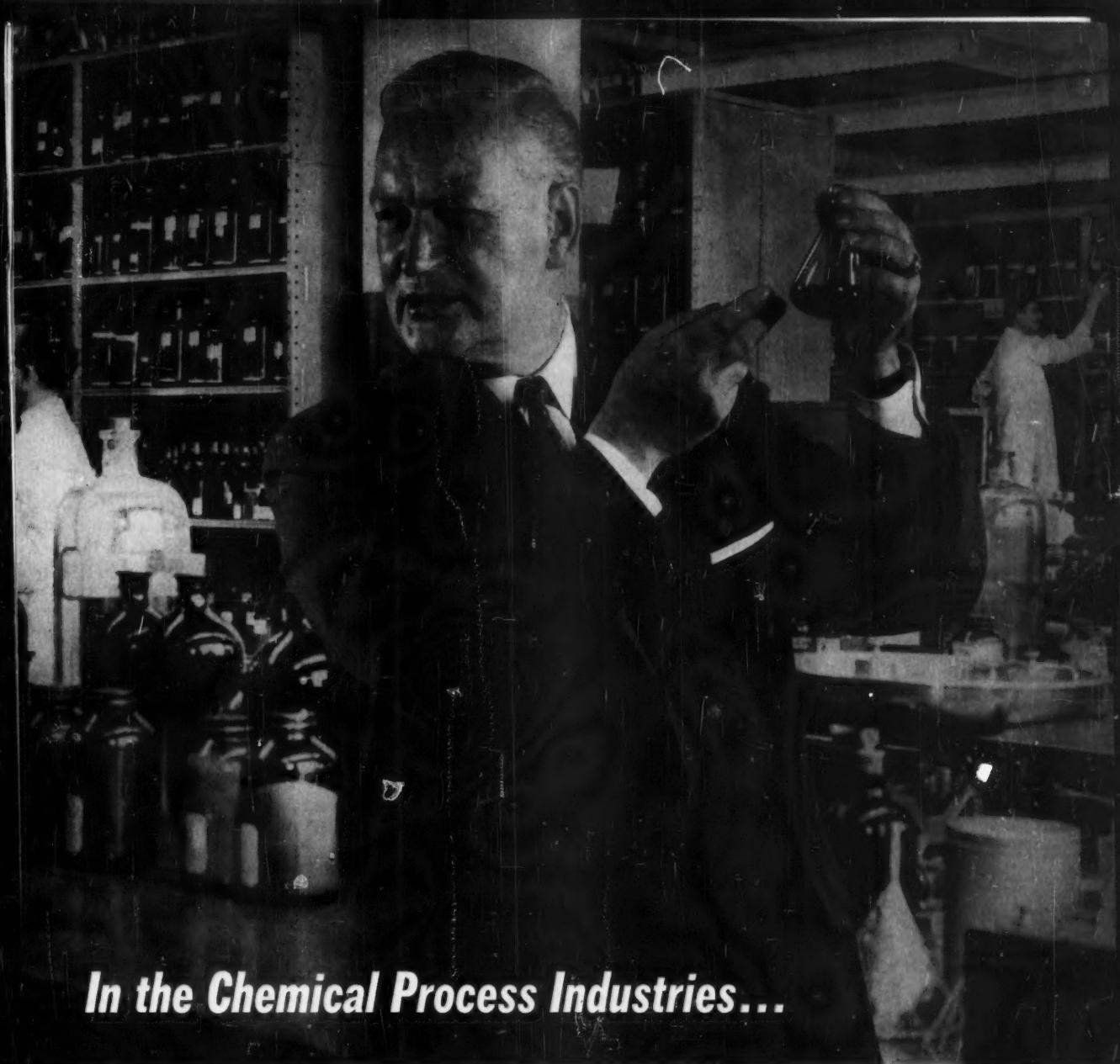
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## ENGINEERING

pensive corrosion-resistant stainless steel, in another to permit a long run of pipe to double as a condenser.

• The carbon-black filter house was reoriented to permit easy access from a roadway for both filter loading and disposal of spent solids.

• Other tall structures were tied in with the prilling tower so that common elevator and stairway facilities could be used.

• Piping runs were shortened, saving investment in fittings and materials and cutting operating costs as a result of lower pressure drops.

**Higher Quality:** One of the most important advantages of using the model technique, says Jacks, is the quality improvement it contributes to a project. The model enables design engineers to give the customer a plant that's practically custom-built to his particular needs—at no additional expense.

## PROCESSES

**Nitric Acid:** A new method of recovering platinum and rhodium catalysts—developed by Oesterreiche Stickstoffwerke AG. (Linz, Austria)—allows more severe conditions to be used in nitric acid production. Conservation of the expensive catalyst permits use of preheating, higher temperatures and a more concentrated ammonia solution—all of which reduce operating costs but chew up catalyst. The recovery method consists of placing a layer of granular refractory oxides (e.g., calcium oxide) in the calcining furnace to filter out platinum and rhodium separated from the catalyst grid as the ammonia is oxidized. This layer will filter out 68-88% of the metal at temperatures of 1380-1580 F, will remain effective for at least a year.

The Austrian company figures the recovery costs as follows: 1 ton of oxide (costing about \$10) will filter up to 6.5 lbs. of metal (valued at \$77/troy oz. for platinum, \$225/troy oz. for rhodium); cost of recovering the metal from the oxide is about \$70/lb. The company has patented the method, is licensing it.

**Pure Anthracene:** A simple method of producing highly purified anthracene for use as a scintillation substance has been developed by the Technical Physics Laboratory at the

Technische Hochschule at Munich (Germany). Technical-grade anthracene, containing 0.05% naphthacene, is azeotropically distilled with ethylene glycol at 197 C to produce a pure product containing less than  $5 \times 10^{-5}$  mol% of naphthacene. Final purification includes water washing, drying and high-vacuum sublimation. The material is equivalent to that produced by the more troublesome chromatographic method.

**Photochemical Route:** The Chemical Institute of the University of Tübingen (Germany), in cooperation with Badische Anilin- & Soda-Fabrik (Ludwigshafen), has developed a method for producing oxime hydrochlorides photochemically. Nitric oxide and chlorine react with saturated hydrocarbons under the influence of light to produce a mixture of high-purity chloro-nitroso or bis-nitroso compounds, depending on reaction conditions. Oxime hydrochlorides are produced if hydrogen chloride is added at the same time as the other reactants. The developers of the process point out that it may have commercial possibilities as a new route to lactams for the production of fibers and plastics. For instance, caprolactam is the end-product when cyclohexane is the starting hydrocarbon.

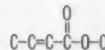
The Soviets claim to already have a plant making caprolactam by a similar process. Said to have been newly built in the Armenian Kirovakan combine, the plant is reported to use photosynthesis to produce caprolactam from cyclohexane and nitrosyl chloride.

**Dialdehyde Starch:** The U.S. Dept. of Agriculture is now piloting a new process at Peoria, Ill., for producing dialdehyde starch, a potentially valuable agent for tanning, sizing or binding. The starch is produced by oxidation from cereal crops; periodic acid used in the process is regenerated in an electrolytic cell. Key to scaling up the route: efficient recovery of periodic acid.

**Automatic Bleach System:** Hooker Chemical Corp (Niagara Falls, N.Y.) has received a patent (U.S. 2,889,119) on its automatic and continuous processes for producing high-quality calcium hypochlorite bleach liquor at rates of more than 20,000 gal./day.

# Eastman Briefs

## FOR JUNE



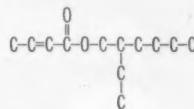
### Methyl Crotonate

Form	liquid
Sp. Gr., 25°C	0.946
Boiling point, 760 mm.	118°C
Purity, %	99+

Here's a newly available ester with polymerization possibilities. With vinyl acetate, for instance, it produces a clear, solid copolymer when heated in the presence of benzoyl peroxide.

**Eastman Chemical Products, Inc.**  
Kingsport, Tennessee

**B5**



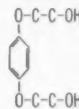
### 2-Ethylhexyl Crotonate

Form	liquid
Sp. Gr., 22°C	0.882
Boiling point, 760 mm.	130°C
Purity, %	99+

With its conjugated double bond, this crotonic ester will get a rise out of those looking for new dienophiles for Diels-Alder reactions.

**Eastman Chemical Products, Inc.**  
Kingsport, Tennessee

**B6**



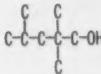
### Hydroquinone $\beta$ -Hydroxyethyl Ether

Form	solid
Melting point	101-102°C.
Boiling point, 0.3 mm.	190-200°C.
Hydroxyl number, mg. KOH/g	555-565

This unusual ether is a natural for new and interesting polyesters. Try it. Ours had excellent flexibility, hardness, and heat resistance.

**Eastman Chemical Products, Inc.**  
Kingsport, Tennessee

**B8**



### 2,2,4-Trimethylpentanol

Form	liquid
Specific gravity, 20°C.	0.8296
Boiling point, 760 mm.	166-168°C.
Purity, %	98-99

The business end of this alcohol offers a promising reaction site for building heat-stable esters with lube base possibilities. Note the absence of beta-hydrogen atoms.

**Eastman Chemical Products, Inc.**  
Kingsport, Tennessee

**B9**



### Propionaldehyde

Form	liquid
Boiling point, 760 mm.	48°C.
Specific gravity, 20°C.	0.808
Purity, %	96.5

It's low-boiling, flammable and unpleasant to smell, but the versatility of this low-molecular-weight aldehyde extends from beta-valerolactone with ketene to acrylonitrile with ammonia.

**Eastman Chemical Products, Inc.**  
Kingsport, Tennessee

**B10**

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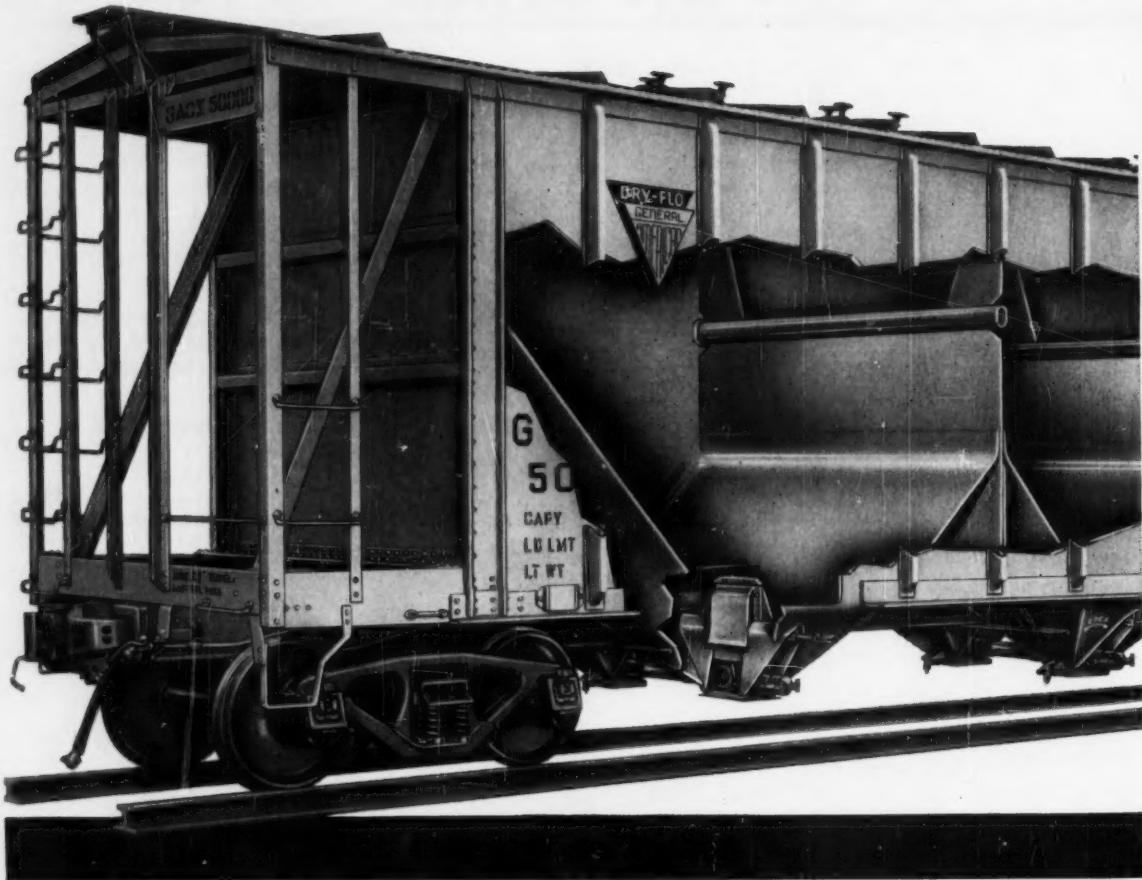
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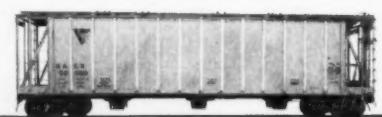
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**CORPORATION**

## Putting New Muscle in Ag Chemical Sales

Next week, International Minerals & Chemical Corp. (Skokie, Ill.) will launch its new Agricultural Chemicals Division. The new division will be formed by merging IMC's far-flung potash and phosphate operations. Major results of the shuffle:

- Expansion of sales force and conversion to multiproducts selling. Now, the division staffers will sell all basic agricultural chemical raw materials.
- Formation of a special customer-service department.
- Establishment of a long-range planning group.

As a result, IMC hopes to provide more comprehensive customer service with less duplication of effort, may even trim sales costs in the bargain. The firm thus joins the many other large chemical companies now using a single sales force to sell related products.

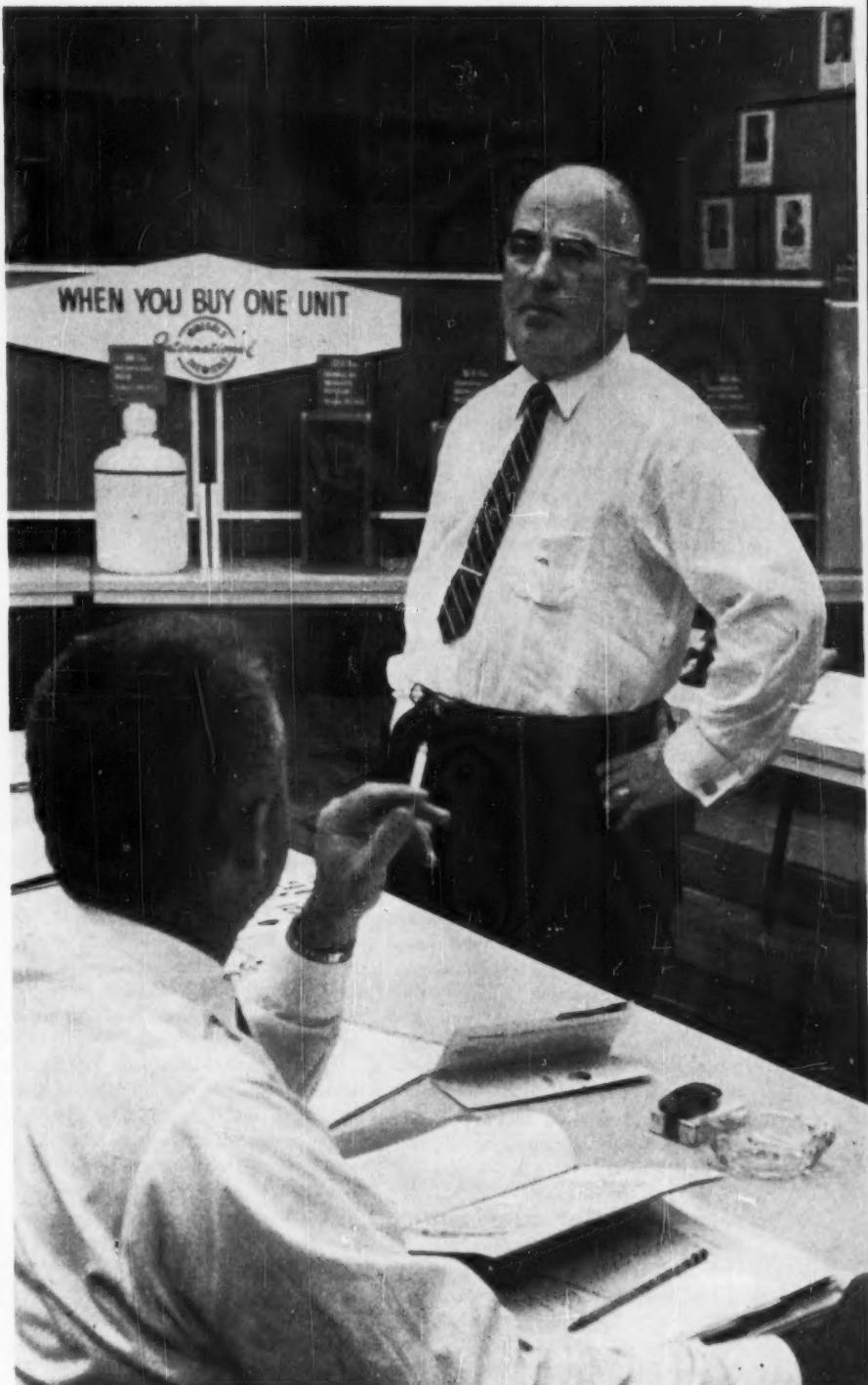
The reorganization stems, in part, from the previously introduced "Full Orbit" marketing program (CW, Dec. 27, '58, p. 33), which has substantially boosted sales and profits. Results of the Full Orbit campaign have already led to augmented budgets for next year's program. At the same time, IMC officials noted a significant buying trend: more customers were buying several basic fertilizer raw materials sold by separate divisions. IMC salesmen from several divisions were calling on the same accounts, sometimes with a bare minimum of coordination.

**Stimulating a Change:** Recently, IMC surveyed about 25% of U.S. fertilizer manufacturers, found still more evidence of the need for closer supplier-customer relations. Fertilizer makers measured the value of supplier relations on three points:

- Frequency of sales calls.
- Total time spent per call.
- Efficiency of salesmen's pitch.

Many fertilizer manufacturers preferred one-man, multiproduct service to the frequent calls of several one-product specialists.

**Sales Expansion:** The new Agricultural Chemicals Division will field 23 salesmen, 25% more than the previous complement. Sales will be directed



IMC's Gopp directs new division's toughening-up process.

## SALES

by Leonard Gopp, new vice-president for sales. Territories will be trimmed, and each salesman will be able to concentrate on a reduced number of accounts. Responsibility for each account will now rest with each man.

Moreover, salesmen will now be better able to discuss the effects of a customer's product planning upon his over-all raw-material needs.

**Customer Service:** IMC looks for improved customer relations from its newly formed customer-service department. Typical duties of this unit: making sure all orders receive prompt handling and shipment, relieving salesmen of much detail of processing complaints, and solving unusual delivery problems.

**Boost for Planning:** Long-range planning activities (directed by Vice-President Nelson White) will be greatly expanded. IMC President Tom Ware explains that the company, for the first time, can justify it as a result of the Full Orbit program. Major item on the long-range group's agenda: integration of IMC's new, \$25-million potash mine in Saskatchewan, due on-stream in '60.

The merger of the potash and phosphate divisions culminates a move started last fall, when the phosphate chemicals and phosphate minerals divisions were combined, and salesmen put to selling products of both lines.

The switch to full-product-line selling was not very difficult, says IMC. The company has found that over 80% of its salesmen had experience selling two or more of its raw materials.

Now, to further smooth the transition, all field representatives have taken a week-long refresher course, with additional training to come when warranted. Some sessions are conducted at the mines and processing locations. These give salesmen first-hand experience with production problems, give production people a better insight into the difficulties of customers and salesmen.

Also in the scheme is a product manual of fertilizer technology. The company claims it's the first of its kind in the industry.

The full program, of course, will take time to develop and evaluate. But, IMC is hoping that the new Agricultural Chemicals Division will match the success of the company's Full Orbit program.

## Kudos for Value Analysis

**Value analysis—a buying concept based on detailed evaluation of each item that must be purchased—was the hot topic for 250 chemical buyers meeting in New York last week.**

The idea is surging in popularity among chemical companies. Primary reason: the plan points a way to savings because of the detail with which every aspect of a purchase is examined. Purchase price, product quality, the supplier's services—these are among the many aspects considered.

And despite the complexity of the analysis, value analysis is readily adaptable to both large and small companies, a panel at the meeting showed. Elmer Hartgerink, for example, plant manager for Sumner Chemical Co. (Zeeland, Mich.), showed how the plan was used by his small firm.

At Sumner (a division of Miles Laboratories), raw materials usually account for 60-75% of the finished product's total costs. (Sumner makes a variety of fine-chemicals.) In one case, says Hartgerink, a process required chemically pure sodium hydroxide that cost 46¢/lb. as the raw material, 48¢/lb. when processed into the finished product. Value analysis led to investigation of rayon-grade caustic soda. Net result: the cost contribution of caustic soda in the end-product was pared to 41¢/lb., with monthly savings of \$500.

Switching to higher quality also can sometimes boost savings, says Hartgerink. A 96%-pure lauric acid cost Sumner 10¢/lb. more than a lower-specification material previously used. Yet it produced savings of 25¢/lb. on finished product costs because it handled easier.

Value analysis at big American Viscose also afforded impressive cost reductions. Take the example cited by its chemical buyer, Charles Kline, Jr.:

The firm was purchasing materials at prices that were tied to tabs of commodities traded on a national exchange. Application of value analysis first led to a new supplier that, after examining production facilities, suggested that American Viscose could make the material itself economically. The company is now saving \$150,000 annually.

**Specialist Approach:** Ideally, says

William Gretsch, general purchasing agent for Warner-Chilcott Laboratories, value analysis should be carried out by a purchasing man especially delegated to the task. W-C's expert, for example, was able to point out that 70 items accounted for 90% of total purchases, showed where attention should be focused.

Substitution of 91%-pure isopropanol for 99%-pure material not only led to purchase savings, says Gretsch, but also eventually led production men to a simple, hot-water extraction process.

Other questions, Gretsch says, detailed value analysis can answer:

- Would it be worthwhile to buy some raw materials in package sizes scaled to batch requirements?
- Would tank-wagon purchases and in-plant storage, instead of drum orders, save money?
- Would it be possible to buy materials with seasonal price fluctuations in the off-season? (This, says Gretsch, is especially useful when buying products of natural origin.)

- Can you make money-saving suggestions to your suppliers? (In one case, W-C suggested a vendor use a larger mixer to lower costs and price.)

**Fair Game:** Producer profit margins should be fair game for the value-analyzing chemical buyer. That's the pitch of General Foods' manager of purchasing research and analysis, Jerry Rockefeller. Admittedly, says Rockefeller, getting the data on the supplier costs and return on investment isn't easy. But a surprisingly large amount of information is available to the buyer willing to dig hard and deep.

On one special chemical, General Foods saved \$100,000 by getting a supplier to slice some fat from a large profit margin.

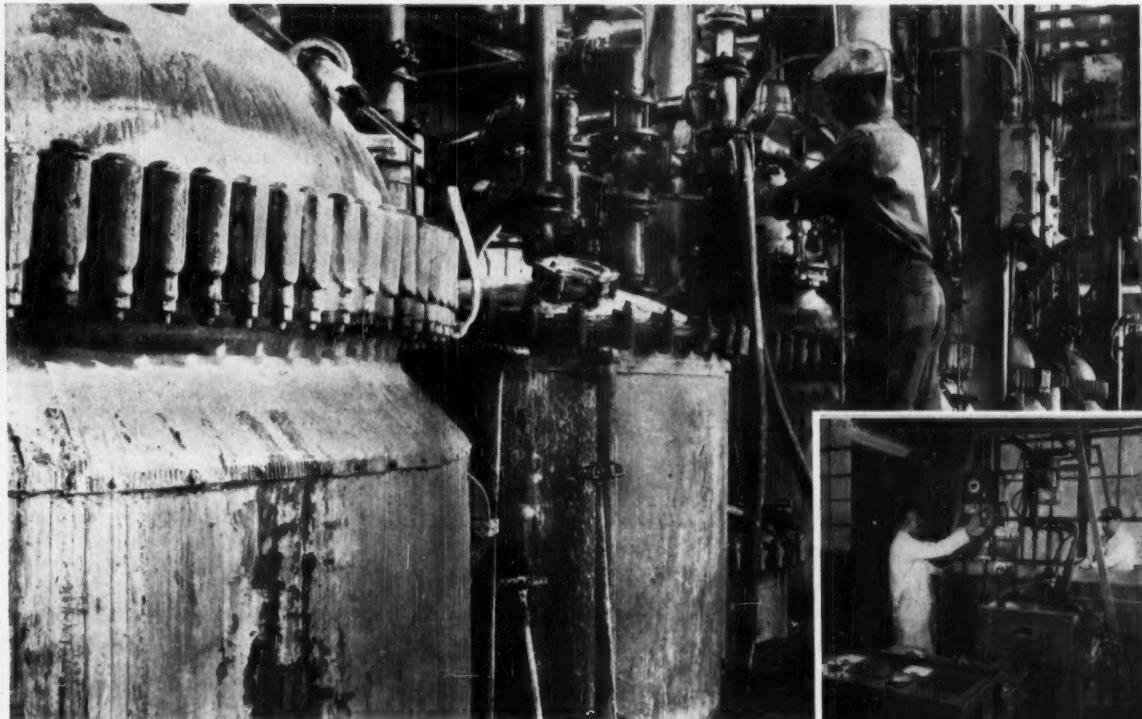
Specification changes also are useful in cutting costs but, says Rockefeller, they are risky for food producers. That's because minor changes can often influence consumer acceptance. On some items, General Foods calculates how much sales can decline before manufacture becomes unprofitable. In some cases, a 5% cost reduction more than offsets a 30% sales decline.

There's little doubt that value anal-



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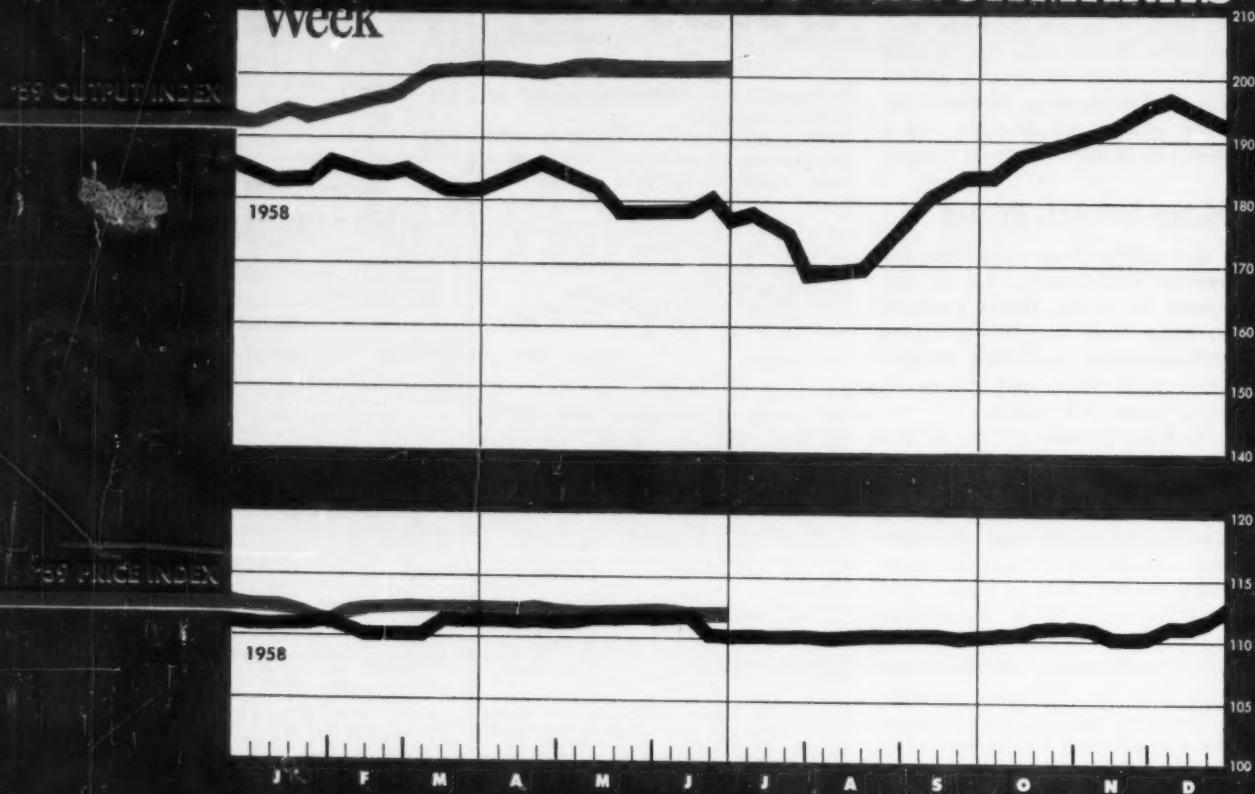
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Agency—Foot, Cone & Belding, Inc.		Agency—MacManus, John & Adams, Inc.		CHEMICALS: Offered/Wanted	99
ARMOUR PHARMACEUTICAL CO.	74	MONSANTO CHEMICAL CO.	51-54	CONTRACT WORK WANTED	99
Agency—Jordan-Sieber & Corbett, Inc.		Agency—Needham, Louis & Brorby, Inc.		EMPLOYMENT	99
ATLANTIC REFINING CO.	88	MOREHOUSE-COWLES, INC.	86	EQUIPMENT: Used/Surplus New For Sale	99
Agency—N. W. Ayer & Son, Inc.		Agency—Willard G. Gregory & Co.		WANTED	99
BADGER MFG. CO.	18-19	MORTON SALT CO.	68	MANAGEMENT SERVICES	99
Agency—F. P. Walther Jr. & Assoc.		Agency—Needham, Louis & Brorby, Inc.		REAL ESTATE	99
BAKER & ADAMSON DIV., ALLIED CHEMICAL CORP.	2nd cover	NOPCO CHEMICAL CO.	45	SELLING OPPORTUNITIES: Available/Wanted	99
Agency—Kastor, Hilton, Chesley, Clifford & Atherton, Inc.		Agency—Gray & Rogers Adv.		SPECIAL SERVICES	99
BARNEBEY CHENEY CO.	76	NOPCO CHEMICAL CO., JACQUES WOLF DIV.	42		
Agency—Odiorne Industrial Adv.		Agency—Gray & Rogers Adv.			
BLOCKSON CHEMICAL CO.	73	NORTH AMERICAN CAR CORP.	1		
Agency—Wm. Balsam Adv.		Agency—Doremus & Co. Adv.			
CATALYTIC CONSTRUCTION CO.	60	OLIN MATHIESON CHEMICAL CORP.	42, 90	ADVERTISING STAFF	
Agency—Doremus-Eshleman Co.		Agency—Doyle, Kitchen & McCormick, Inc.			
CELANESE CORP. OF AMERICA	63	ORONITE CHEMICAL CO.	13	Atlanta 3	Michael Miller
Agency—Ellington & Co., Inc.		Agency—L. C. Cole Co.		1801 Rhodes-Haverty Bldg., JACKSON 8-6951	
CHEMICAL PRODUCTS DIV., CHEMTRON CORP.	75	OWENS ILLINOIS GLASS CO.	20	Boston 16	Paul F. McPherson, 250 Park Square Building, HUBBARD 2-7160
Agency—The Griswold Eshleman Co.		Agency—J. Walter Thompson Co.		Chicago 11	Alfred D. Becker, Jr., R. J. Claussen, 520 N. Michigan Ave., MOhawk 4-5800
CHEMICAL SOLVENTS, INC.	56	PENNSALT CHEMICALS CORP.	15	Cleveland 13	H. J. Sweger, Duncan C. Stephens, 1164 Illuminating Bldg., 55 Public Square, SUPERIOR 1-7000
Agency—Asher, Godfrey & Franklin, Inc.		Agency—The Aitkin-Kynett Co., Adv.		Dallas 1	Gene Holland, Gordon Jones, The Vaughn Bldg., 1712 Commerce St., RIVERSIDE 7-5117
CHEMICAL WEEK	91	PETRO-TEX CHEMICAL CORP.	32	Denver 2	J. Patten, 1740 Broadway, ALPINE 5-2981
CORCO CHEMICAL CO.	41	REICHHOLD CHEMICALS, INC.	35-38	Detroit 26	H. J. Sweger, Jr., 856 Penobscot Bldg., Woodward 2-1798
Agency—Ray Ellis Advertising, Inc.		Agency—MacManus, John & Adams, Inc.		Frankfurt/Main	Michael R. Zeynel, 56 Westendstrasse, Germany
CUNNINGHAM-LIMP CO.	31	ROHM & HAAS CO.	46-47	London E.C. 4	E. E. Schirmer, McGraw-Hill House, 95 Farringdon St., England
Agency—MacManus John & Adams, Inc.		Agency—Arndt, Preston, Chapin, Lamb & Keen, Inc.		Los Angeles 17	Robert Yocom, 1126 West Sixth St., HUNTINGTON 2-5450
DU PONT DE NEMOURS & CO. INC., E. I. FREDON PRODUCTS DIV.	17	SHELL CHEMICAL CORP.	70	New York 36	Knox Armstrong, B. A. Johnson, P. E. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXFORD 5-5959
Agency—Batten, Barton, Durstine & Osborn, Inc.		Agency—J. Walter Thompson Co.		Philadelphia 3	William B. Hannum, Jr., 6 Penn Center Plaza, LOcust 8-4330
DURIRON CO., THE	4th cover	TECHNICON CONTROLS, INC.	74	Pittsburgh 22	Duncan C. Stephens, Room 1111, Henry W. Oliver Bldg., EXPRESS 1-1814
Agency—Kircher, Helton & Collett, Inc.		Agency—Smith, Winters Matubuchi, Inc.		San Francisco 4	William C. Woolston, 68 Post St., DOUGLAS 2-4600
EASTMAN CHEMICAL PRODUCTS CO.	93	TEXAS GULF SULPHUR CO.	2	St. Louis 8	R. J. Claussen, 3615 Olive St., Continental Bldg., JEFFERSON 5-4887
Agency—Fred Witter Adv.		Agency—Sanger-Funnell, Inc.			
EIMCO CORP., THE	8	TRULAND CHEMICAL CO.	2nd cover		
Agency—Matais Co.		Agency—Ray Ellis Adv.			
ENJAY CO.	81	UNION BAG-CAMP PAPER CORP.	44		
Agency—McCann-Erickson, Inc.		Agency—Smith, Hagel & Knudsen, Inc.			
ETHYL CORP.	23	UNION CARBIDE CHEMICALS CO. DIV. OF UNION CARBIDE CORP.	84		
Agency—Reach, McClinton & Co., Inc.		Agency—J. M. Mathes, Inc.			
GENERAL AMERICAN TRANSPORTATION CORP., DRY FLO DIV.	94	U.S. RUBBER CO.	66		
Agency—Edward H. Weiss & Co., Inc.		Agency—Fletcher Richards, Calkins & Holden, Inc.			
GENERAL MILLS, INC.	24	U.S. STEEL CORP., U.S. STEEL PRODUCTS DIV.	29		
Agency—Knox Reeves Adv., Inc.		Agency—Batten, Barton, Durstine & Osborn, Inc.			
		VERONA DYESTUFFS	50		
		Agency—James Civille Adv.			



# BUSINESS BENCHMARKS



JUNE 27, 1959

## WEEKLY BUSINESS INDICATORS

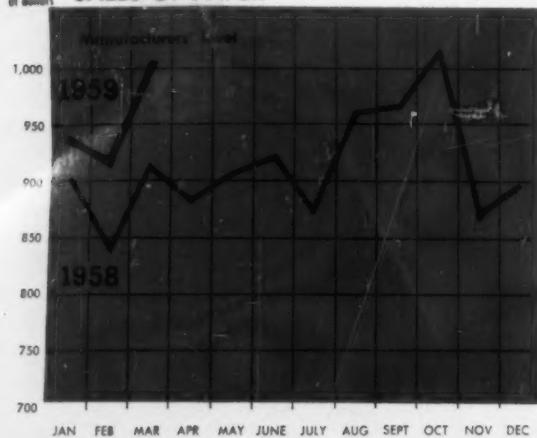
Chemical Week output index (1947-1949=100)  
Chemical Week wholesale price index (1947=100)  
Stock price index (11 firms, Standard & Poor's)  
Steel ingot output (thousand tons)  
Electric power (million kilowatt-hours)  
Crude oil and condensate (daily av., thousand bbls.)

**MONTHLY—Wholesale Prices (1947-49=100)**

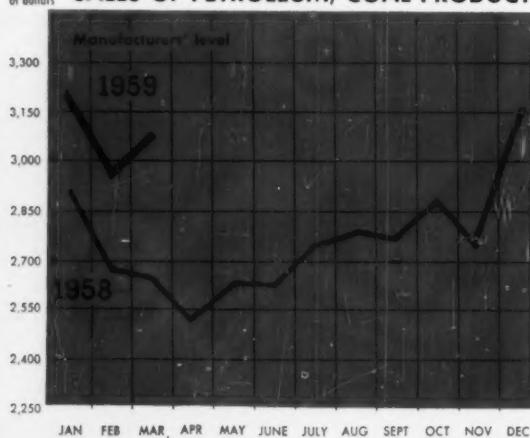
All commodities (other than farm and foods)  
Chemicals and allied products  
Industrial chemicals  
Paint and paint materials  
Drugs, pharmaceuticals and cosmetics  
Fats and oils (inedible)  
Fertilizer and materials

Latest Week	Preceding Week	Year Ago
201.8	201.5	174.5
111.9	111.9	110.6
56.67	56.93	40.65
2,631	2,681	1,751
13,503	13,023	12,109
7,009	7,032	6,334
Latest Month	Preceding Month	Year Ago
128.3	128.3	125.3
110.0	110.0	110.8
123.8	123.9	123.9
120.2	120.2	120.2
93.0	92.9	94.3
60.8	60.4	61.5
107.5	107.5	110.3

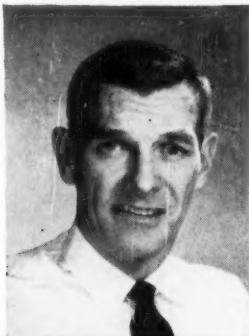
**SALES OF PAPER**



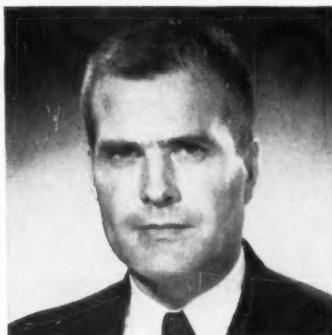
## SALES OF PETROLEUM, COAL PRODUCTS



**"I'm interested in boron trifluoride because  
it's an easy catalyst to work with" . . .** Plant Superintendent



**"I'm most interested in the high reactivity  
of boron trifluoride" . . .** Research Director



**"I've discovered that by using  $BF_3$  we can  
simplify our plant designs" . . .** Chief Engineer

## What interests you most about Boron Trifluoride?

Whatever your reasons for investigating boron trifluoride, you'll find Baker & Adamson® is your best source of information. B&A has long been the leader in  $BF_3$  research and production. B&A was the first to introduce boron fluoride etherate to industry . . . has shipped boron fluoride gas by tube trailer transport for many years—making it readily available in large commercial quantities. Today, B&A offers the widest range of  $BF_3$  complexes, including ether, phenol, monoethylamine, other nitrogen and oxygen compounds. That's why—when it comes to  $BF_3$  call on Baker & Adamson.

### **Useful product data bulletins**

B&A has compiled extensive reference data on the use

of boron fluoride gas and its complexes as efficient catalysts in organic synthesis. Boron fluoride's wide range of applications and its cost-cutting production advantages—such as its ease of catalyst removal—make it a factor to be considered in almost any organic synthesis problem. Write today for any or all of the free technical bulletins listed below:

<b>TITLE</b>	<b>CODE No.</b>
Boron Trifluoride, Compressed Gas . . . . .	DA-34691
Boron Trifluoride, Compressed Gas Handling Information . . . . .	TB-34691
Boron Fluoride Complexes with Nitrogenous Compounds . . . . .	DA-3469-NIT-1
Boron Fluoride Complexes with Oxygen- Containing Compounds . . . . .	DA-3469-OXY-1
Boron Trifluoride, Ether Complex, Tech. . . . .	DA-34711
Boron Trifluoride, Monoethylamine Complex, Tech. . . . .	DA-34661
Boron Trifluoride, Phenol Complex, Tech. . . . .	DA-34681

### **New book on Boron Fluoride**

The most extensive study of boron fluoride to date is contained in a new book, "Boron Fluoride and its Compounds as Catalysts in Organic Chemistry," written by A. V. Topchiev, S. V. Zavgorodnii and Y. M. Paushkin. It discusses the use of boron fluoride as a catalyst in organic chemistry and also its derivatives and molecular compounds. Contents include physical and chemical properties; co-ordination compounds; compounds of boron fluoride in alkylation, polymerization, isomerization, cyclization, nitration and sulphonation reactions; condensation reactions in the presence of boron fluoride; and many other topics.

This book (price, \$12) is published by Pergamon Press, Inc., 122 East 55th St., New York 22, N. Y.

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